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COMMERCIAL FISHERIES REVIEW

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FISH AND WILDLIFE SERVICE

JOHN L. FARLEY, DIRECTOR

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

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COVER: "Join the Fish Parade" emblem portrays the theme of National Fish Week, October 29-November 3, 1956. An all-industry consumer and trade publicity campaign is scheduled to run in newspapers, magazines, radio, television, and grocery and restaurant publications. A number of national associations and chain and independent retail organizations are advising their members how they can cash in on the promotion. Allied industries such as the Rice Industry will feature "Fish Parade" in their own publicity and advertising. The U. S. Fish and Wildlife Service will notify all food and trade associations of the program, and a press release was issued on September 19 by the Secretary of the Interior announcing support of the program. The U. S. Department of Agriculture will list the program as a Merchandising Opportunity in the tie-in material that goes to the "Plentiful Foods List." (See outside back cover of this issue.)

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COMMERCIAL FISHERIES REVIEW

September 1956 Washington 25, D.C. Vol. 18, No. 9

DEVELOPMENT OF THE PACIFIC COAST OCEAN SHRIMP FISHERY

By James L. Squire, Jr. *

BACKGROUND

The Pacific Coast as a commercial shrimp-producing area is historically one of the oldest in the United States--shrimp fishing began about 1869. This early fishery, which started in San Francisco Bay, has continued through the years for a species of shrimp (Crago franciscorum) commonly known as "San Francisco Bay shrimp." The San Francisco Bay fishery today yields an annual catch of about 900,000 pounds. The inside waters of Puget Sound have in the past also yielded considerable quantities of shrimp. These two areas have been the major shrimp producers on the West Coast of the United States.

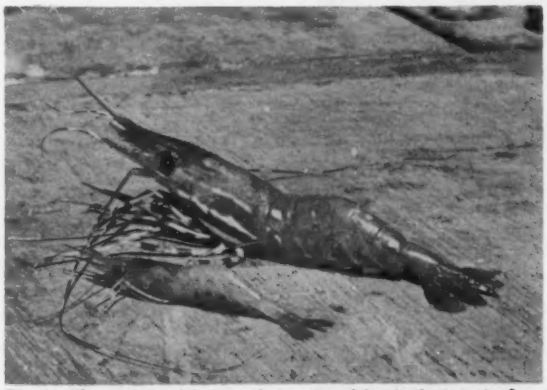

Fig. 1 - The commercial ocean shrimp (Pandalus jordani) in the foreground and a large ($8\frac{1}{2}$") spot prawn (P. platycerous), a species that is taken occasionally during commercial trawling for ocean shrimp.

But it was not until 1952 that the ocean shrimp off the Pacific Coast were first commercially fished. On April 28, 1952, the first trip of deep-water ocean shrimp (Pandalus jordani) was landed by the trawler Grace H at the port of Morro Bay, Calif. From this modest beginning is developing a commercial fishery of economic importance to the Pacific Coast fishing industry. Exploratory fishing by state and Federal government agencies have laid the groundwork for the development of this growing fishery.

EXPLORATORY FISHING

In 1950 to 1953 exploratory fishing by the California Department of Fish and Game research vessel N. B. Scofield resulted in charting six areas having dense concentrations of ocean shrimp off the California coast. The areas where the ocean shrimp are found in commercial concentrations are from 40 to 90 fathoms in depth on green mud bottom. The concentrations off the northern portion of California were thought to extend possibly as far as Cape Blanco, Ore.

Subsequent activity by the commercial shrimp trawlers operating out of Crescent City, Calif., has developed the area off the extreme south end of Oregon and excellent catches have been reported from this area.

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During 1952 exploratory ocean shrimp fishing was conducted by the Oregon Fish Commission, using the chartered trawler Nel Ron Dic. Promising indications of shrimp were obtained in areas off Coos Bay, Cape Lookout, and Tillamook Head, Ore. Regulatory measures concerning the future fishery were issued in 1952 by the Oregon Fish Commission and the first commercial ocean shrimp fishing off Oregon began in 1953.

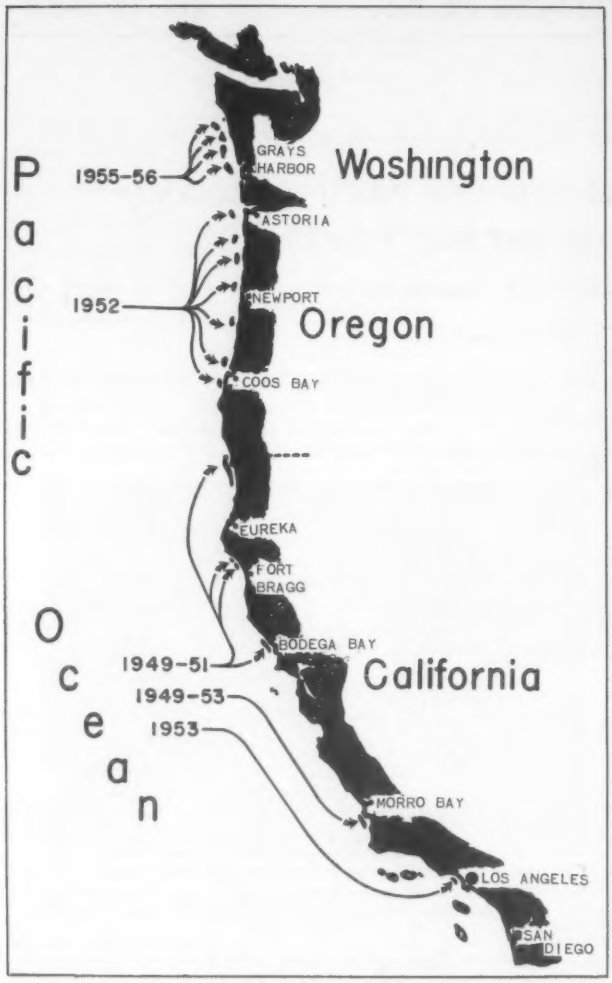


Fig. 2 - Map of exploratory fishing results.

Exploratory fishing conducted off the coast of Washington by the Service's exploratory fishing vessel John N. Cobb, in cooperation with the State of Washington in late 1955, revealed shrimp over a widespread area off the Washington coast. Indications for a possible successful commercial fishery for ocean shrimp off the coast of Washington during the summer months, which are more favorable to the production of shrimp, was corroborated by this information. Additional exploratory work by the John N. Cobb in April 1956 again produced good catches. During a short period of "production trawling," catches averaged better than 1,400 pounds (heads on) for an hour of trawling, using a 40-foot Gulf of Mexico flat trawl, indicating that during this more favorable time of the year commercial-scale production is possible. The catches made with the flat trawl, which, unlike Pacific Coast fish trawls, is without extended wings and is tied close up to the doors, included relatively few fish. The catch composition appeared to be about the same in flat-trawl and beam-trawl hauls when working on known shrimp grounds, but the flat-trawl catches were larger. The producing areas as developed to date are all offshore in the sense of being outside the international three-mile limit.

COMMERCIAL OCEAN FISHERY

In 1952 the first season of ocean shrimp fishing off California saw a total catch landed in California of over 198,000 pounds. Landings at Morro Bay, Calif., accounted for the bulk of the landings with small amounts landed at the ports of Bodega Bay and Eureka in Northern California. Little interest in ocean shrimp fishing and processing was exhibited in Northern California in 1952, but this area during the 1955 season was the largest producing area in the State.

Two vessels fished for shrimp off Morro Bay, Calif., in 1952. Considering the type of gear used (16-foot and 18-foot beam trawls), the catch for an hour of trawling

Fig. 3 - Shrimp trawler at Morro Bay, Calif., showing beam trawl and "A" frame which is used for towing and handling the beam.

Fig. 4 - Setting the 18-foot beam trawl.

was very high, averaging close to 700 pounds of shrimp for every hour of trawling. Occasional catches of as high as 4,000 pounds an hour were recorded in this area. The ex-vessel price to the fisherman was 10 cents a pound (heads on), and a normal day's catch would run 1,000 to 3,000 pounds.

Fig. 5 - Hauling up the trawl after a $\frac{1}{2}$-hour tow.

Fig. 6 - Beam trawl secured to the "A" frame with a bag of shrimp breaking water in the foreground.

The 1953 ocean shrimp catch for the States of California and Oregon was approximately 240,000 pounds. California with landings of 205,000 pounds accounted for most of the total catch, with increased landings in the Northern California area. However, as in 1952, the great percentage of the California ocean shrimp catch was made in the area off Morro Bay by the same vessels that fished in 1952. The catch for an hour's trawling decreased from the 1952 average high of 700 pounds an hour to about 540 pounds an hour in this southern area.

In Oregon, the first commercial catch of ocean shrimp was made in June 1953 by the trawler Nel Ron Dic. The catch was landed and processed at Coos Bay, Ore.

During the 1953 season 25,000 pounds of ocean shrimp were landed, with the majority caught in the vicinity of Cape Lookout, Ore., to Cape Elizabeth, Wash., and processed at Garibaldi, Ore. Only a small amount of shrimp was landed and processed at Coos Bay, Ore., during the 1953 season.

Fig. 7 - Net and bag of shrimp being landed on the port side.

In 1954 increased interest by Northern California processors and fishermen resulted in an increase in the total landings of ocean shrimp to about 305,000 pounds. Since the best available records indicate the Oregon fishery did not produce any ocean shrimp during 1954, the total West Coast catch (excluding Alaska and British Columbia) can, therefore, be credited to fishing off the California shore. The majority of the catch in California was landed at the ports of Bodega Bay and Crescent City, with each port sharing about equally in the total catch. The shrimp grounds off Morro Bay, which previously had supported the State's major production, failed to produce shrimp in commercial quantities in 1954. Numerous attempts were made by local shrimp

Fig. 8 - Shrimp bag coming over the rail.

Fig. 9 - Pulling the cod-end rope to release the $\frac{1}{2}$-hour's catch of 700 pounds of ocean shrimp.

trawlers to locate profitable production areas, without success, and as a result production from off Morro Bay was only 5 percent of the 1953 catch. Three trawlers

Fig. 10 - Emptying the catch into deck bin.

Fig. 11 - Sorting out unwanted material and stowing in small boxes (35 to 50 pounds per box) to prevent crushing.

produced the majority of the California catch in 1954 and these trawlers plus two additional vessels continued their operations again during the 1955 season.

Record production during 1955 was the reason the total ocean shrimp catch more than doubled that of 1954. The Pacific Coast landings of deep-water ocean shrimp totaled 722,363 pounds in 1955. California accounted for 716,976 pounds, with 382,777 pounds of this total landed at Crescent City and 332,753 pounds at Bodega Bay. For the second year the shrimp area offshore from Morro Bay produced only a token amount of shrimp after repeated fishing efforts.

Fig. 12 - Unloading a portion of the day's catch at Morro Bay, Calif. Shrimp is landed raw heads on.

Oregon production in 1955 was 5,387 pounds, with the major portion of the catch made off Newport, Ore., in the area bounded by Hecate Bank and Cape Lookout.

STATE REGULATIONS

CALIFORNIA: The State of California enacted in 1951 legislation prescribing certain regulations for the ocean shrimp fishery as a result of information gained on the possible magnitude of the resource by exploratory fishing results. The State waters were divided into three areas, each with a specified poundage quota limit. Total production possible under the original regulation was 2.5 million pounds (heads on) a season. In 1956 the area from Point Conception to Pigeon Point (below San Francisco) was made an illegal area for shrimp trawlers. In this area lies the original producing fishery (off Morro Bay, Calif.) which after two years of very low production was ordered closed by the State Fish and Game Commission. The total production now legally possible during a season is 1.6 million pounds (heads on) as a result of reduced fishing areas and quotas.

Gear restrictions enacted in 1952 specified the use of beam trawls, with a maximum width of 20 feet, and a net mouth circumference of not over 45 feet. The original minimum mesh regulation of $1\frac{1}{8}$ inches was increased to $1\frac{1}{2}$ inches for the cod end in 1956; in 1957 all meshes are required to be $1\frac{1}{2}$ inches.

The limiting of the gear to beam trawls is an attempt by the State conservation agency to lessen the effect small mesh nets may have on the existing flatfish trawl fishery. Beam trawls are claimed to be less efficient in the capture of finfish when compared to otter trawls. If large otter trawls of small mesh were allowed this would work to the detriment of the otter-trawl bottom fishery, which operates in the same area and is presently limited to a mesh size of not less than $4\frac{1}{2}$ inches.

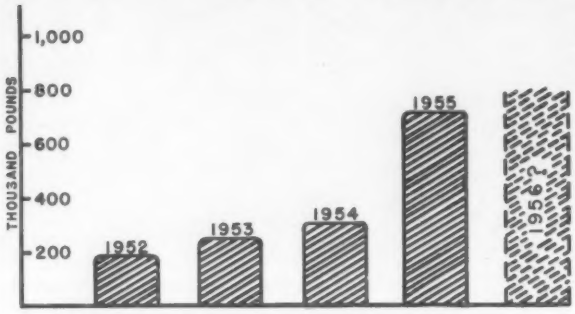


Fig. 13 - West Coast ocean shrimp production, 1952-1955.

A season was established extending from April 1 to September 30 or until the poundage quota was caught. In 1954 the season was adjusted to May 1 to October 15 to correspond more closely to the period of the year when the shrimp are not carrying fertile eggs.

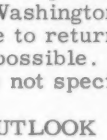
OREGON: The only regulation affecting ocean shrimp fishing off the State of Oregon is that shrimp fishing shall be with beam trawls. The size of the beam or net mesh are not specified nor are season or poundage regulations invoked.

WASHINGTON: Ocean shrimp may be taken by beam trawls and otter trawls. The size of the gear is not restricted except that the mesh of shrimp nets shall not be less than $1\frac{1}{2}$ inches. The State of Washington specifies that shrimp trawlers shall be equipped with a sorting device to return the unmarketable undersize shrimp to the water as soon after capture as possible. Season, poundage, or area restrictions for the ocean shrimp fishery are not specified.

OUTLOOK

Factors that will determine how rapidly and to what size this fishery will develop are many. Because economically processing these small shrimp is a problem, many fish dealers are reluctant to enter the field of ocean-shrimp processing. The cost of labor for picking the small shrimp results in a high production cost which is reflected in a high wholesale price. However, the quality of the frozen vacuum-packed cooked-and-peeled "cocktail size" product is such that it has been able to meet competition from other domestic and foreign sources. The total quantity of shrimp available to the commercial fishery is unknown in many cases, and as a result the total seasonal production potential cannot be predicted at the present time.

The Pacific Coast ocean shrimp fishery developed as the result of extensive exploratory fishing activities in the various areas. These explorations and the efforts of commercial fishermen and processors have developed a marine resource that is providing added income for the Pacific Coast fishing industry.



NEW PRODUCTS FROM FISH OILS

Part II - Polyamino Fatty Acids Derived from Fish Oils

By R. N. McDonald* and Edward H. Gruger, Jr.**

ABSTRACT

The work reported in this paper is directed toward finding new uses for fish oils and consists in studying the chemical derivatives of their constituent fatty acids. Among these derivatives are the polyamino fatty acids, which should have excellent surface-active properties, owing to their highly polar and polyfunctional character. They therefore may find use as fungicides, corrosion inhibitors, detergents, and ore-flotation agents.

In the preparation of the polyamino fatty acids, amination of the double bonds in unsaturated fatty acids and esters was attempted by three methods.

The first method involved the conversion of polyhalo acids to polyamino acids by the reaction with liquid ammonia. Initial work done on the various haloacids prepared from the reaction of purified oleic acid with hydrobromic acid, with hydriodic acid, and with bromine.

The second method involved (1) the reaction of tetranitromethane with the double bonds and (2) the subsequent reduction of the nitro groups. Only the reaction between tetranitromethane and oleic acid and their reaction products were investigated in this phase of the program.

The third method involved the alkylation of potassium phthalimide with the addition products of hydriodic acid and of bromine to methyl oleate in an attempt to provide an intermediate for the synthesis of polyamino fatty esters. The hydrolysis of the phthalimido groups on these compounds to produce amines will be the subject of further study.

INTRODUCTION

Fish oils contain components that are unique in chemical structure and that are not common in animal or vegetable oils. These components possess an unusually high degree of unsaturation: that is, they contain a large number of carbon to carbon double bonds. Relatively little work has been done on the investigation of derivatives of fish oils, owing to the difficulty in separating the pure compounds from complex mixtures in the oils and to the instability of the unsaturated compounds when in contact with air.

Fig. 1 - Methanol-urea countercurrent distribution of urea inclusion compounds of long-chain fatty substances.

WORK AT SEATTLE LABORATORY: The work at the Seattle Technological Laboratory has been directed toward finding new uses for fish oils. The investigation of chemical derivatives of the constituent fatty acids in fish oil has been the major project. The importance of this work has been described by Stansby (1956). In this investigation, the type of derivative chosen is such as to take advantage of the unique character of unsaturation.

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Note: "Part I - Introduction" appeared in Commercial Fisheries Review, August 1956, p. 1.

Polyamino fatty acids[1/] are a class of derivatives that may be prepared by utilizing the unsaturated portion of fish-oil fatty acids. Polyamino fatty acids have potentialities as copolymers, as complexing agents, as sequestering agents, and as fungicides, corrosion inhibitors, detergents, ore-flotation agents, and other surface-active agents. Their preparation, in essence, involves the addition of ammonia to the double bonds.

LITERATURE RESEARCH: The scientific literature shows that very little work has been done on the lower homologs (C_2 to C_8) regarding amination of the double bonds and that no work has been done on the higher homologs. The patent literature reports a considerable number of processes for the amination of olefins, using high pressure, high temperature, and usually a catalyst of reduced cobalt or nickel oxide (Teter 1947, Teter and Olson 1950). This high-pressure catalytic amination with ammonia has been carried out with several of the olefins of lower molecular weight (C_2 to C_6). The yields per pass of material over the catalyst is poor (10 to 15 percent). Thus recycling of materials is required to increase the yields.

Groggins (1952) has listed several aminating reagents and amination reactions. The aminating reagents listed are (1) liquid ammonia, (2) aqueous ammonia, and (3) ammonia in an inert solvent. Aqueous ammonia almost always produces secondary and tertiary amines. A problem that arises in the use of ammonia is to find an inert solvent that will readily dissolve both the ammonia and the compound to be aminated and that will be easily removable. The amination reactions listed by Groggins are (1) the conversion of halogen compounds, (2) the replacement of sulfonate or sulfate groups, (3) the conversion of alcohols, and (4) the reaction of ammonia with hydrocarbons.

Julius v. Braum and co-workers (1937) have discussed the advantages of liquid ammonia over aqueous or alcoholic solutions for use in the preparation of primary amines from organic halogen compounds. In general, the action of aqueous or alcoholic ammonia on organic halogen compounds is not well adapted to the preparation of primary amines because secondary and tertiary amines and some quaternary ammonium halides are formed. The use of liquid ammonia should favor the formation of primary amines.

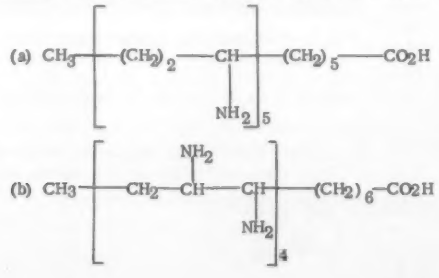
Harwood (1952) has given a good review of the syntheses of amines.

DISCUSSION OF EXPERIMENTS

AMINATION WITH LIQUID AMMONIA: The work at the Seattle laboratory began with the attempt to convert long-chain polyhalo fatty acids, which had been prepared from the unsaturated fatty acids of fish oils, to polyamino acids by amination with liquid ammonia. The initial work was carried out on purified oleic acid in order to avoid the complications that arise from the complex mixture found in fish oil and to simplify the investigation of the reaction and of the products. Three types of haloacids were prepared from oleic acid by the addition of hydrobromic acid, of hydriodic acid, and of bromine to the double bond. These reactions can be represented by equations 1 and 2, where the reaction of hydriodic acid is the same as that of hydrobromic acid:

$$2\ CH_3{-}(CH_2)_7{-}CH{=}CH{-}(CH_2)_7{-}COOH + 2HBr \longrightarrow$$
$$CH_3{-}(CH_2)_7{-}\underset{\displaystyle Br}{CH}{-}(CH_2)_8{-}COOH + CH_3{-}(CH_2)_8{-}\underset{\displaystyle Br}{CH}{-}(CH_2)_7{-}COOH \qquad (1)$$

1/For example, the formulae of some polyamino fatty acids may be as follows:



$$CH_3-(CH_2)_7-CH=CH-(CH_2)_7-COOH + Br_2 \longrightarrow$$
$$CH_3-(CH_2)_7-\underset{Br}{CH}-\underset{Br}{CH}-(CH_2)_7-COOH \qquad (2)$$

The reaction of these haloacids with ammonia was complicated by the fact that they solidified at the temperature of liquid ammonia. In the purification of the reaction products, every attempt to crystallize the long-chain amino acids (or diamino acids) failed. Work was therefore directed toward finding a method of synthesis that would be more successful.

AMINATION BY REDUCTION OF NITRO GROUPS: Another method that was attempted for the synthesis of polyamino acids involved (1) the reaction of tetranitromethane with the unsaturated fatty acids and (2) subsequent reduction of the transferred nitro groups attached to the long-chain acids. Whitmore (1951) has shown that, in methyl alcohol, tetranitromethane adds to double bonds. With oleic acid this reaction can be expressed according to equation 3.

$$CH_3-(CH_2)_7-CH=CH-(CH_2)_7-COOH + CH_3OH + C(NO_2)_4 \longrightarrow$$
$$CH_3-(CH_2)_7-\underset{OCH_3}{CH}-\underset{NO_2}{CH}-(CH_2)_7-COOH + CH(NO_2)_3 \qquad (3)$$

The reduction of the nitro groups is represented by equation 4.

$$CH_3-(CH_2)_7-\underset{OCH_3}{CH}-\underset{NO_2}{CH}-(CH_2)_7-COOH \xrightarrow[HCl]{Sn} CH_3-(CH_2)_7-\underset{OCH_3}{CH}-\underset{NH_2}{CH}-(CH_2)_7-COOH \qquad (4)$$

Neutralization equivalents were used to check whether or not the reaction proceeded with oleic acid. Various solvents were studied to determine which one was conducive to a reaction that would give a good yield of the desired product. In all but one of the solvents studied, the products were oils and would not crystallize.

In a reaction of tetranitromethane with methyl oleate, the one exceptional solvent (dry pyridine--absolute ethanol in 2.5:1.0 ratio) produced a crystalline product melting at 72° to 74° C. With this reaction, however, the product decomposed on standing at room temperature. The supernatant liquid from the crystallization produced an oil that could not be crystallized. Separation by a five-stage methanol-urea countercurrent distribution (figure 1) of an ether-extracted portion of the oily product gave five fractions, of which the first three had iodine numbers ranging from 44 to 65 and of which the last two had iodine numbers of 0.

A tin and hydrogen chloride reduction of the crystalline product was carried out, and the reaction product was isolated. This product has not as yet been identified. Analysis of the infrared spectra will show whether or not the reaction has produced an amino acid ester.

Similarly, infrared analysis of the crystals of the expected nitro compound will show whether or not nitration has occurred. These analyses have been postponed until the use of an infrared spectrophotometer can be obtained.

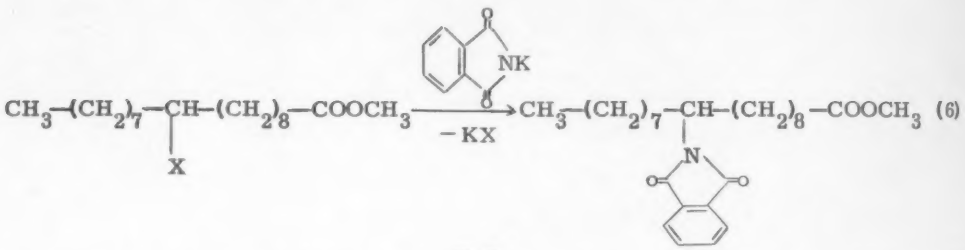
Owing to the oily character of the products, to the apparent difficulty in obtaining the products as crystals, and to the instability of the polynitro compounds, another method was sought for the synthesis of the polyamino fatty acids.

AMINATION BY ALKYLATION OF POTASSIUM PHTHALIMIDE: The Gabriel synthesis was thus the next reaction tried for preparing polyamino fatty acids. This reaction involves two steps: (1) the conversion of alkyl halides to alkyl phthalimides and (2) the hydrolysis of the alkyl phthalimides to alkylamines.

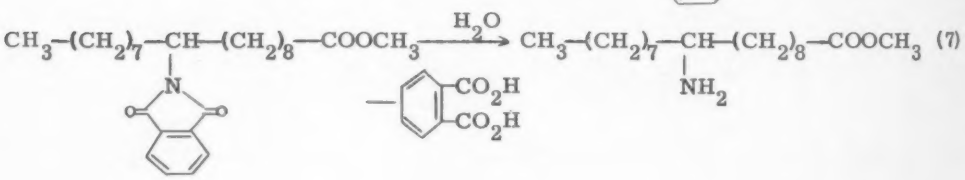
The conversion of methyl oleate, by means of the Gabriel synthesis, can be represented by the following equations:

$$CH_3-(CH_2)_7-CH=CH-(CH_2)_7-COOCH_3 \xrightarrow{HX} CH_3-(CH_2)_7-\underset{\displaystyle X}{CH}-(CH_2)_8-$$

$$COOCH_3 + CH_3-(CH_2)_8-\underset{\displaystyle X}{CH}-(CH_2)_7-COOCH_3 \qquad (5)$$



$$CH_3-(CH_2)_7-\underset{\displaystyle X}{CH}-(CH_2)_8-COOCH_3 \xrightarrow[-KX]{} CH_3-(CH_2)_7-\underset{\displaystyle N}{CH}-(CH_2)_8-COOCH_3 \qquad (6)$$



$$CH_3-(CH_2)_7-\underset{\displaystyle N}{CH}-(CH_2)_8-COOCH_3 \xrightarrow{H_2O} CH_3-(CH_2)_7-\underset{\displaystyle NH_2}{CH}-(CH_2)_8-COOCH_3 \qquad (7)$$

Again, as stated earlier, a pure compound had to be used as the starting material for the preliminary study of the reaction. Methyl oleate was used to prepare methyl 9, 10-dibromooctadecanoate. The latter compound was purified by carrying out a six-stage methanol-urea countercurrent distribution. This step was followed by a chromatographic separation, using an alumina-packed column. A white crystalline product was obtained, which was then reacted with potassium phthalimide. The product obtained in turn from this reaction was a gray-brown crystalline solid, characteristic of alkyl phthalimides.

A similar reaction of potassium phthalimide and methyl 10-iodooctadecanoate was carried out, producing characteristic gray-brown crystals. Consequently, further study of the products is necessary.

CONCLUSIONS

(1) The conversion of polyhalo fatty acids or esters by their reaction in liquid ammonia does not appear to be a suitable method for preparing polyamino fatty acids. This method may be made successful, however, provided a suitable mutual solvent can be found that will prevent the precipitation of reactants at the temperature of liquid ammonia and provided that steric effects in the molecules will prohibit the formation of secondary-amino acids.

(2) The method of preparing polyamino fatty acids by reducing nitro groups and utilizing the reaction of tetranitromethane may be a feasible solution to the problem if oily products are satisfactory. Owing to the long-chain character of the mole-

cules of these products, oils are to be expected. Also, the increased polarity of molecules containing polyfunctional groups will tend to produce oils. To identify the reaction products and to determine if the conversion is successful, however, crystalline products are desired.

(3) The Gabriel synthesis may possibly be the most successful solution to the problem of preparing polyamino fatty acids. Its value, however, has not yet been fully determined.

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JAPAN LEADING PRODUCER OF FISHERY PRODUCTS

Statistics of the Food and Agriculture Organization of the United Nations show that Japan is the leading producer of fishery products, as it has been for many years. The Japanese produce approximately 17 percent of the world catch, followed by China, Russia, and the United States (which produces about 9 percent of the world catch).

It has been estimated that almost 50 percent of the world catch of fishery products was made by Asiatic countries, while somewhat over one-fourth was taken by European countries. North American countries account for about 13 percent of the total, and African countries about 6 percent.

--Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.

"TENTATIVE" METHOD FOR DETERMINING COATING CONTENT OF FROZEN FRIED FISH STICKS

The voluntary United States standards for grades of frozen fried fish sticks (Federal Register, July 21, 1956) provide that "frozen fried fish sticks contain not less than 60 percent, by weight, of fish meat." In order to determine compliance with this requirement for officially-graded products, work was carried out at the Service's Technological Laboratory at East Boston, Mass. A physical method has been developed which permits rapid analysis. Considerable interest in the method has been expressed by members of the fish-stick industry in the New England area. Several demonstrations to local industry groups have been carried out. At present commercial lot samples are being analyzed to check the lot-sampling rates.

Fish sticks coming off a conveyor belt system after they have been breaded.

The method of analysis is simple and requires only a comparatively short time. It consists of the following: (1) weigh whole frozen stick, (2) dip stick in a colored solution at room temperature for a specified time, (3) remove coating by scraping with a spatula, (4) weigh remaining fish meat, and (5) calculate percentage of fish meat content by the formula:

$$\frac{\text{(weight of fish meat after removing coating) X (100)}}{\text{(weight of whole frozen fried fish sticks)}}$$

In order to obtain accurate results, various specific procedures must be followed and certain precautions must be exercised. A complete report on the procedure will be issued at a later date. In the meantime, however, it is possible that producers of fish sticks may be interested in the method of analysis as a quality-control tool. A limited supply of a "nonofficial" draft of the procedure has been prepared and copies are available from the Fishery Technological Laboratory, U. S. Fish and Wildlife Service, 61 Sumner Street, East Boston, Mass.

FEDERAL SPECIFICATION FOR CHILLED AND FROZEN CRABMEAT

The Federal Specification for Crab Meat, Cooked; Chilled and Frozen, PP-C-656a, was issued March 6, 1956. This specification supersedes Interim Federal Specification PP-C-00656a, May 2, 1955 and the original Federal Specification PP-C-656, March 31, 1931.

The new specification was developed by the Technological Section of the U. S. Fish and Wildlife Service and the Quartermaster Food and Container Institute for the Armed Forces. It was approved by the Commissioner, Federal Supply Service, General Services Administration, for use of all Federal agencies. The new requirements reflect modern methods and improvements in preparation and packaging of fresh and frozen crab meat. Three species of crab are specified: blue, dungeness, and king.

Federal fish specifications are prepared by the U. S. Fish and Wildlife Service as needed to meet the requirements of two or more Federal agencies for the government purchase of fishery food items. They are in general use throughout the government agencies. A Federal fish specification is a definite, accurate, and complete statement of the requirements for a particular fishery product and of the procedures to be followed in determining compliance with these requirements. They are issued by the Federal Supply Service, General Services Administration, and are designed to cover existing commercial products. A specification is issued only after complete review by the various Government agencies and the fishery industries. (See Commercial Fisheries Review, vol. 14, no. 5, pp. 14-16, May 1952; vol. 17, no. 8, pp. 9-10, August 1955.)

PROSPECTS OF UTILIZING LITHIUM SALTS OF FATTY ACIDS FROM FISH OILS IN LUBRICATING GREASES

A possibly large field for use of fish oils appears to exist in the newly-developed, high-temperature, lithium salts lubrication greases. A review of the literature in Chemical Abstracts for the years 1952, 1953, and 1954 has indicated 23 separate articles and patents on lithium salts in greases. No attempt was made to go further into the literature for it seemed that the work reported in recent years would give a good indication of the progress and development being made in an apparently new field of lubricating greases.

A review of five United States patents on greases containing lithium salts indicated that the subject is well covered. Of these patents, two were found to include the use of hydrogenated-fatty acids from fish oils. No information was found regarding the use of the natural unsaturated fatty acids in these greases.

The types of lithium fatty acid salts that are most often used are stearates, hydroxystearates, and hydrogenated fatty acid salts such as those produced from hydrogenated fish oils or tallow. The lithium fatty acid salts are reportedly used in concentrations of as little as 4.5 percent to as much as 35 percent of the total grease composition, depending on the desired properties of the lubricant.

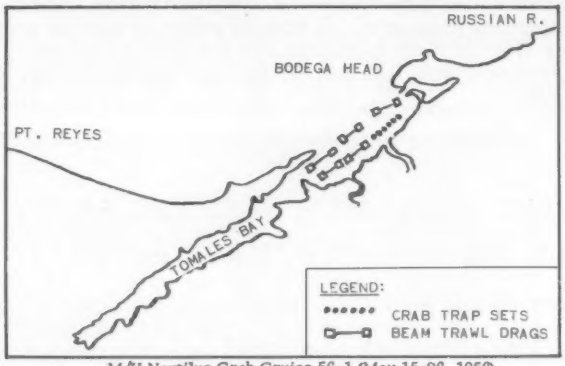
The lithium salts reportedly used and included in the patent were prepared from fatty acids containing from 12 to 24 carbon atoms per molecule. Salts prepared from fish-oil fatty acids possess an average carbon-chain length greater than those prepared from animal or vegetable oils. If, as seems to be the case, this unique characteristic imparts improved properties to the greases, then fish oils are a logical choice for this purpose.

On the basis of utilizing saturated fatty acids, hydrogenated fish oils should be a better choice than oils from animal or vegetable sources from the cost standpoint. It is suggested that lithium salts of hydrogenated fish-oil fatty acids be promoted for use in high temperature lubricating greases. Their prospects for this application should be very good.

TRENDS AND DEVELOPMENTS

California

CRAB TRAP SAVINGS-GEAR STUDIES BY M/V "NAUTILUS" (Cruise 56-N-1): To conduct savings-gear studies using different size escape openings on crab traps and to obtain samples of small crabs by beam trawling were the primary objectives of the California Department of Fish and Game cruise with the M/V Nautilus from May 15 to May 26.



M/V Nautilus Crab Cruise 56-1 (May 15-26, 1956).

A total of 24 commercial-size crab traps were fished off Central California in the Bodega Bay area; 8 were equipped with two $4\frac{1}{4}$" circular escape openings each, 8 with two 4" circular openings each, and 8 with no provision for escapement. The traps were alternately set in one line, i.e.--no escape, 4", $4\frac{1}{4}$", no escape, etc. They were spaced about 200 feet apart and covered a distance of approximately one mile. Depths fished were from 42 to 46 feet.

An 8-foot beam trawl with a 1" mesh net was used to catch small crabs.

Savings-Gear Studies: The traps were pulled and emptied every 2 days, and were set again in approximately the same place. Rockfish frames were used as bait. A total of 40 sets each were made with the no escape opening and 4"-escape-opening traps, and 39 sets with $4\frac{1}{4}$" escapes. One of the $4\frac{1}{4}$"-escape-opening traps was lost.

From a total of 119 trap sets, a total of 1,485 market crabs (Cancer magister) and 2 red crabs (Cancer productus) were caught. The following table is a summary of the catch for the type of escape opening used.

	MALE CRABS						FEMALE CRABS					
	No Escape Opening		4" Opening		$4\frac{1}{4}$" Opening		No Escape Opening		4" Opening		$4\frac{1}{4}$" Opening	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Legal (over $4\frac{3}{8}$")	42	15.4	55	19.2	42	32.0	28	5.4	37	18.6	38	50.6
Sublegal ($4\frac{1}{4}$" to $4\frac{3}{8}$")	78	28.7	126	43.9	60	45.8	23	4.4	42	21.1	8	10.7
Sublegal (4" up to $4\frac{1}{4}$")	132	48.5	105	36.6	28	21.4	151	29.0	105	52.8	8	10.7
Sublegal (under 4")	20	7.4	1	.3	1	.8	319	61.2	15	7.5	21	28.0
Totals	272	100.0	287	100.0	131	100.0	521	100.0	199	100.0	75	100.0

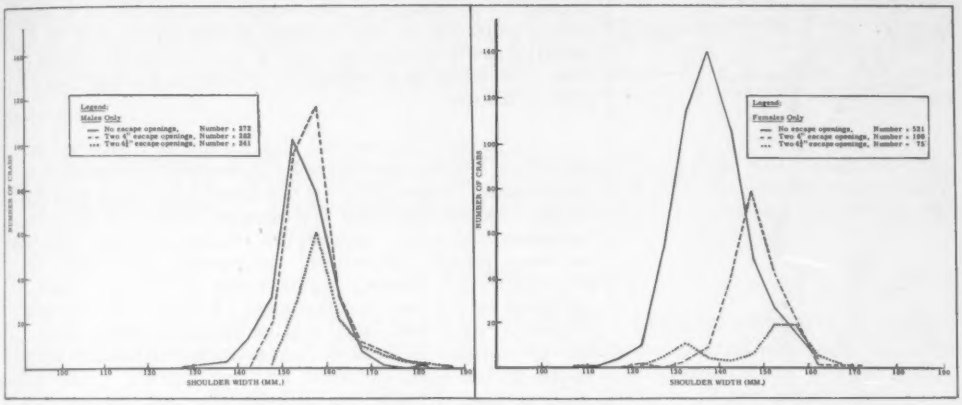
Males: $4\frac{1}{4}$" to $4\frac{3}{8}$" in length = 155 mm. to 159 mm. shoulder width.; 4" up to $4\frac{1}{4}$" in length = 145 mm. to 154 mm. shoulder width.

Females: $4\frac{1}{4}$" to $4\frac{3}{8}$" in length = 148 mm. to 152 mm. shoulder width.; 4" up to $4\frac{1}{4}$" in length = 139 mm. to 147 mm. shoulder width.

(The shoulder width is a caliper measurement just in front of the last antero-lateral spine.)

Width and weights of the total catch were taken on May 17. This catch included 100 males and 197 females.

Beam Trawling: A total of 8 drags were made with the beam trawl. These were usually of 15 to 20 minutes duration. Market crabs were taken in all drags and included several year-classes. As many as 500 crabs of an average shoulder width size of 12 mm. were taken in one tow; 174 crabs of an average shoulder width of 85


Legend:
Males Only
No escape openings, Number = 372
Two 4" escape openings, Number = 282
Two 6" escape openings, Number = 241
NUMBER OF CRABS
SHOULDER WIDTH (MM.)
Legend:
Females Only
No escape openings, Number = 521
Two 4" escape openings, Number = 160
Two 6" escape openings, Number = 75
NUMBER OF CRABS
SHOULDER WIDTH (MM.)

Width frequencies of market crab (Cancer magister)--escape opening studies for traps (May 1956, Bodega Bay).

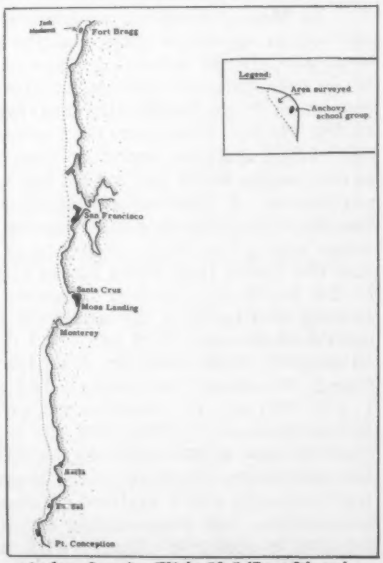
mm. were caught in another drag. The latter are believed to be from last year's hatching. Samples of megalops (crab larvae) were obtained the first day. These were sighted swimming on the surface of the water and were scooped up with a bucket. Efforts to keep them alive on board were not too successful. However, a few were held long enough to molt into the first crab stage.

* * * * *

AIRPLANE FLIGHTS TO STUDY PELAGIC FISH DISTRIBUTION (Flight 56-5): The fifth of a series of periodic flights to study pelagic fish distribution, abundance, and behavior in 1956 off the coast of California were conducted by the State's Department of Fish and Game. The inshore area between Fort Bragg and Monterey, and the offshore area around San Nicolas, Santa Catalina and Santa Cruz Islands was surveyed by Beechcraft 4758N (June 8 and June 11-13). The inshore area from Monterey to Pt. Baja, Baja California was surveyed by Cessna "170" 1359D.

As on previous flights this year anchovies dominated the inshore area over the entire extent of the coast covered, with jack mackerel and sardines occupying the offshore area.

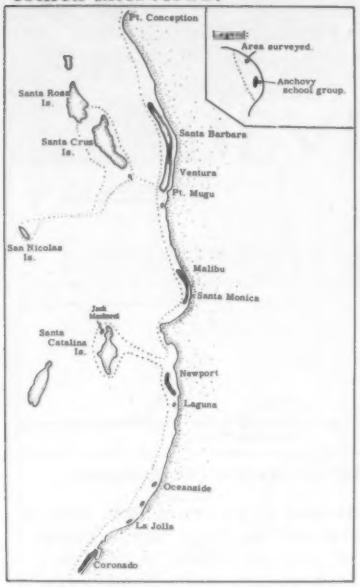
No euphausiid swarms were observed in the central California area as were found in April and May indicating that this swarming phenomenon is a seasonal behavior of the offshore shrimplike species Euphausia pacifica. Recent oceanographic studies conducted at Hopkins Marine Station have revealed the presence of such a phenomenon and the above aerial observations have confirmed the results of this more intensive study.



Airplane Spotting Flight 56-5 (June 8th and 15th, 1956).

Commercial and live-bait fishing were active along the California coast in June, and

identification of schools sighted in areas of fishing activity was confirmed by fishermen interviews.



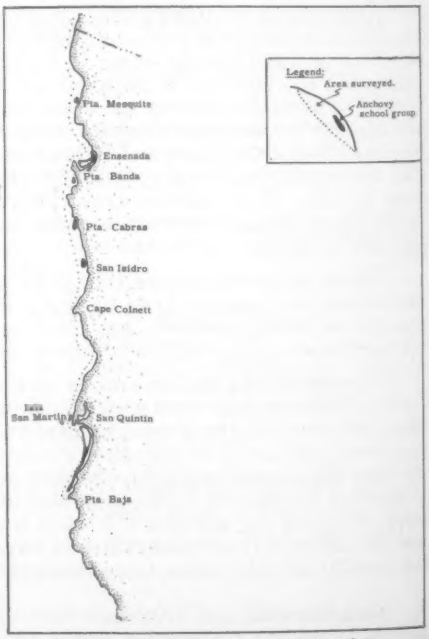
Airplane Spotting Flight 56-5 (6/11-15/56).

The total area of fish schools seen was determined by measuring the length and width of a sample of schools in each school group by means of a small prism scope containing a graduated reticle. The following is a summary of the observations of fish schools:

Anchovy: In central California (Pt. Reyes to Pt. Conception) anchovies increased in abundance since May, especially in the Monterey Bay and Avila areas. Monterey Bay fishermen could not obtain commercial-size anchovies in June as the fish taken were small "four-inch" anchovies, probably of the 1955-year class. Apparently the larger fish present in the bay for the past $1\frac{1}{2}$ years have been replaced by a school group of younger fish. For the first time in over 6 years anchovies have been found in the area between Pt. Sal and Pt. Conception. This brings to light the possibility that the heretofore partially isolated group of anchovies frequenting the Avila area is an extension of the southern California-northern Baja California population.

Anchovies in southern California remained in approximately the same abundance as in May 1956, however there was a considerable change in distribution of the school groups. The main concentration of anchovies in June was in the area between Goleta and Port Hueneme, whereas in May the main concentration was in the area between Pt. Vicente and Laguna.

In March 1956 no anchovies were observed in northern Baja California. In June, however, large school groups of anchovies were encountered almost continuously along the coast from the California-Mexico border to Pt. Baja. Commercial fishermen working out of San Quintin reported that the anchovies in that area were too small for commercial purposes. A similar situation existed along the Baja California coast during June of 1955, when young fish were found near San Quintin, and the older fish were found along the coast to the north and farther offshore. The following is a tally of the anchovy schools observed and total area (sq. ft.) of fish tallied in each 10-mile section in which fish were found: Central California--163 schools, 1,412,000 sq. ft.; Southern California--1,162 schools, 7,482,000 sq. ft.; N. Baja California--1,000 schools, 9,365,000 sq. ft. In addition to these schools, about 10 "breezing" schools were sighted offshore from Oceanside, but since these schools were too far out to observe closely with the small plane their identification was uncertain. In the same area in May a large number of young



Airplane Spotting Flight 56-5 (6/13-14/56).

anchovy schools were sighted in this area and it is possible that these schools have moved farther offshore.

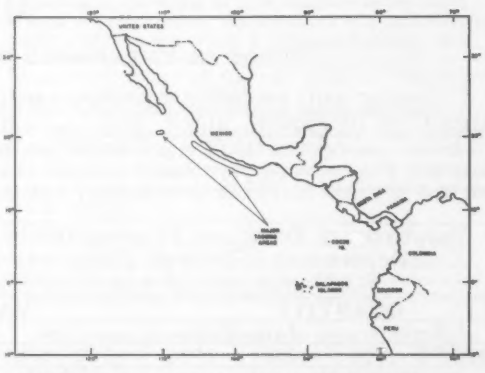
Sardine and Mackerel: Seven mixed jack mackerel and sardine schools were sighted off the east end of Santa Catalina Island. Commercial fishermen reported similar schools at San Clemente, Santa Rosa, and Santa Cruz islands. No pure schools of sardines were sighted during this flight. The pattern of distribution of sardine schools is comparable to that of June in 1955. Twelve schools of fish presumed to be jack mackerel were sighted near Fort Bragg on June 8th.

Other Species: Five schools of yellowtail (Seriola dorsalis) were sighted off La Jolla on June 11. These schools averaged around 60 feet in diameter and were very near the surface. On two occasions fish were observed leaping out of the water.

* * * * *

TWO TUNA-TAGGING CRUISES (M/V "HEROIC," CRUISE 56-C-1 AND M/V "SOUTHERN PACIFIC," CRUISE 56-C-2): Two commercial tuna clippers while on regular tuna-fishing trips were utilized by the California Department of Fish and Game to tag tuna off the west coast of Mexico. The purpose of the cruise was (1) to tag yellowfin and skipjack tuna with white tubular plastic tags, type G, with center protective covering removed; (2) to make collections of fish by live-bait fishing, from bait hauls, and under a light at night; (3) to carry on other phases of tuna studies incidental to main tagging work; and (4) to test tag retention in two different body positions; a new location under the second dorsal fin and under the first finlet, which is the usual position.

M/V Southern Pacific tuna-tagging Cruise C-2-56 (May 15-June 17, 1956).



M/V Heroic tuna-tagging Cruise C-1-56 (Mar. 4-May 24, 1956).

The tuna clipper Heroic (Cruise 56-C-1) sailed on March 4, 1956, and returned on May 4 to San Diego. The area of operations was off the Revilla Gigedo Islands and off the west coast of Mexico. During this cruise 140 yellowfin, 244 skipjack, and 3 black skipjack tuna were tagged, for a total of 387.

Also, during this cruise 36 night-light stations were occupied while drifting at night. Numerous specimens were taken during night and day bait hauls and fishing while anchored. Frozen specimens and 76 bottles of specimens were collected on this cruise.

The tuna clipper Southern Pacific (Cruise 56-C-2) sailed on May 15 and returned June 17 to San Diego. Area of operations was in the vicinity of the Las Tres

Marias Islands, Mexico. A total of 122 fish, 74 skipjack and 48 yellowfin tuna, were tagged and released during the cruise. Porpoise schools were encountered and these areas fished extensively from May 23 to June 10. The fish in these schools were almost entirely two-pole yellowfin tuna; a size too large for practical tagging. Most of the tagging occurred on June 11 and 12, when schools of skipjack and one-pole yellowfin tuna were fished.

Specimens of larvae fish, small fish, and other marine organisms were taken on nine night-light stations, four bait-making stations, and from three hook-and-line stations.

Cans--Shipments for Fishery Products, January-May 1956

Total shipments of metal cans during January-May amounted to 43,555 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 34,027 tons in January-May 1955. The increase in January-May 1956 over that for the same period in 1955 reflects the heavier pack of canned tuna as compared with the January-May 1955 period, when production was curtailed due to oversupply. Many packers of canned fishery products make heavy purchases in April prior to the spring and summer packing season.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, JUNE 1956: A total of 2,737,268 pounds (valued at $1,234,608) of fresh and frozen fishery products for the use of the Army, Navy, Marine Corps, and Air Force were purchased in June 1956 by the Quartermaster Corps. This was an 0.8 percent increase in quantity, but the value declined 6.6 percent as compared with the previous month. Compared with June 1955, purchases were higher by 19.6 percent in quantity and 24.9 percent in value.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (June and the First Six Months of 1956 with Comparisons)

QUANTITY				VALUE			
June		Jan.-June		June		Jan.-June	
1956	1955	1956	1955	1956	1955	1956	1955
. . . (1,000 Pounds) . . .				. . . . ($ 1,000)			
2,737	2,289	12,231	13,114	1,235	988	6,090	5,628

For the first six months of 1956 purchases totaled 12,230,924 pounds valued at $6,089,821--a decline of 6.7 percent in quantity but an increase of 8.2 percent in value as compared with the first six months of 1955.

Prices paid for fresh and frozen fishery products by the Department of Defense averaged 45.1 cents a pound, 3.6 cents less than in May 1955 but higher by 1.9 cents a pound than the June 1955 average.

In addition to the purchases of fresh and frozen fishery products, the Armed Forces generally make some local purchases which are not included in the data given above. Therefore, actual purchases are somewhat higher than indicated but it is not possible to obtain data on the local purchases made by military installations throughout the country.

Florida

FISHERIES RESEARCH, APRIL-JUNE 1956: The following are some excerpts from the Quarterly Report on Fisheries Research, June 1956, of The Marine Laboratory of the University of Miami.

Mullet: Racial investigations on Florida mullet recently completed indicate that they fall into four populations: (1) an east coast population in the area from Jacksonville to Miami; (2) a west coast population from Everglades northward to Steinhatchee; (3) a northwest coast population of Apalachicola and St. Marks; and (4) a Pensacola population. It is possible that there exists a fifth, at Homosassa, but evidence is too sparse to justify such a conclusion at this time.

On the basis of tagging results, it appears that these populations intermingle somewhat with each other but that in general they represent rather concrete entities. From the tagging results it appears that about 90 percent of these fish stay within 20 miles of their respective home grounds, and that 97 percent stay within 100 miles of their home grounds.

Small Shrimp Studies: Trips during April, May, and June were made on the vessel Manboy to the Tortugas area. On these trips a 2¼-inch mesh cod end was used. Samples were taken and the escapement from this mesh size cod end is being evaluated.

An opportunity to intensify this work was presented when the U. S. Fish and Wildlife Service made the exploratory fishing vessel George M. Bowers available to the Marine Laboratory for four nights' work on the Tortugas grounds. It was possible with this vessel to sample inshore areas where smaller shrimp are encountered and some sampling was also done further offshore in depths of 19 fathoms which is deeper than the usual depths worked by the Manboy. Larger shrimp were taken in the deeper waters.

White Shrimp (Penaeus setiferus)

A 2-inch mesh size cod end was used for the inshore work aboard the George M. Bowers and the 2½-inch mesh size for the offshore drags.

Hydrographic, weather, and fishing data were collected on the trips.

Spotted Sea Trout: Nine months of data are now at hand on the life history study of the spotted sea trout, Cynoscion nebulosus, in Florida. This information is providing us with facts concerning the age composition of the population sampled, its growth rate, the location and period of spawning, and the reproductive capacity of the species.

There have been reports of an apparent decline in the fishery. It seems that increased fishing pressure is being placed on this inshore species by sport fishermen and that environmental changes such as dredging, filling, and pollution may also have far-reaching effects on the spotted sea trout as well as other desirable species. Catch records over an extended period of years, from both the commercial and sport fisheries for this species, are being studied to aid in determining the catch per unit of effort and changes which may have occurred.

Fish taken in the samples ranged in size from less than one inch to 34 inches. It appears from the analysis of scale marks and statistical treatment of length frequencies that the oldest were 8 years of age.

Growth appears to be rapid in the first year when an average length of about 6 to 7 inches is attained. Growth is fairly constant throughout life which seems to indicate favorable feeding and activity the year around.

There are indications of a resident population which remains in the Indian and Banana Rivers through the year and a nonresident group which arrives at the onset of cold weather in the north. This is evidenced by the presence of a mixed population of true sea trout, Cynoscion regalis, and the spotted sea trout, Cynoscion nebulosus, in "sea-run" colors off the surf along the central and upper east coast of Florida.

Black Spot in Shrimp: 1. Further experiments with butylated hydroxy toluene ices were carried out to retard black spot in shrimp. Ices containing both the antioxidant BHT and antibiotics were also studied.

2. BHT was also applied to shrimp as a dip. One-percent and 2½-percent dips were prepared. The shrimp were dipped at sea and then stored at the Laboratory in nontreated ices.

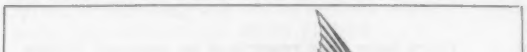
3. Tests were conducted to determine sodium bisulfite concentrations obtainable with a flake ice machine.

Antibiotic Ices for Shrimp: Further tests were carried out to extend the freshness of shrimp through the use of aureomycin and terramycin ices.

Spoilage Determination Tests for Shrimp: Chromatographic analyses of the amino acids in shrimp were continued. The object of this study is to determine whether and what type of relationship exists between the degree of spoilage of shrimp and the quality and quantity of certain amino acids present. It is hoped to use such a relationship as an indicator of recipient spoilage in shrimp.

Gulf Exploratory Fishery Program

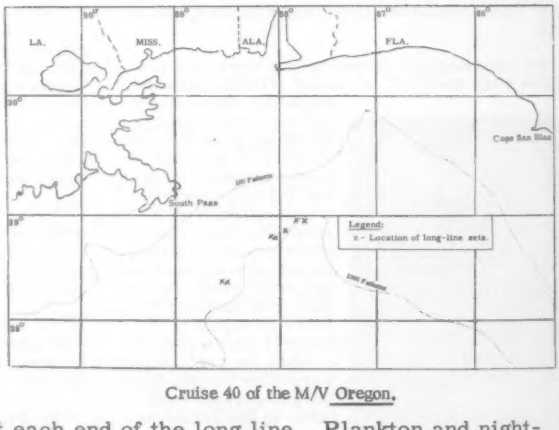
EXPERIMENTAL LONG-LINE TUNA FISHING IN NORTH-CENTRAL GULF BY M/V "OREGON" (Cruise 40): Eight days of experimental long-line tuna fishing in the north-central Gulf of Mexico were completed by the Service's exploratory fishing vessel Oregon during Cruise 40 which ended on July 27 at Pascagoula. Seven sets, averaging 80 baskets (800 hooks) each, were made covering several depth intervals from the surface down to 200 fathoms to obtain further information on depth ranges of Gulf yellowfin tuna stocks.



A total of 157 yellowfin (16,770 pounds), ranging from 42 to 177 pounds each, were landed. Fourteen percent of the catch was damaged to some extent by sharks. Average yellowfin catch rates at the various depth intervals fished were as follows: surface--4.0/100 hooks; 10 fathom buoy lines--4.6/100 hooks; 20 fathoms--3.3/100 hooks; 50 fathoms--3.3/100 hooks; 75 fathoms--2.3/100 hooks; 100 fathoms--1.8/100 hooks; 150 fathoms--no yellowfin catch; 200 fathoms--0.4/100 hooks.

The catch included 15 white skipjack, 14 blackfin tuna, 2 small broadbill swordfish, 14 white marlin, 1 blue marlin, 13 dolphin, 31 sharks, and 1 opah. During the line-hauling operations, 53 white-tipped sharks were killed using a broad-headed lance.

Large schools of mixed blackfin tuna and white skipjack were observed daily. On one occasion, 35 skipjack and 4 blackfin (averaging 15 pounds each) were caught on jackpoles during a 10-minute period while one of these schools fed on a small school of young carangids that had gathered under the stern of the Oregon.



Cruise 40 of the M/V Oregon.

Stomach analyses and fork-length measurements were obtained for the entire catch. Bathythermograph casts were made at each end of the long line. Plankton and night-light dip-net samples were obtained at each station for future study by Service biologists.

A series of 55 yellowfin tuna of different size groups were subjected to various handling and freezing conditions, and samples were frozen for laboratory study by the Service's Technological Section.

Maine Sardines

CANNED STOCKS, JULY 1, 1956: Distributors' stocks of Maine sardines amounted to 154,000 actual cases as of July 1, 1956, a decrease of 81,000 cases (34 percent) from July 1 a year ago. July 1, 1956, stocks were 172,000 cases less than January 1, 1956, according to estimates based on the results of the fifth in a

series of five measurements for the 1955/56 marketing season by the U. S. Bureau of Census.

Canners' stocks as reported by the Maine Sardine Industry totaled 315,000 cases on July 1, 1956. Canners' stocks for the same month in 1955 amounted to 723,000 cases and on January 1, 1956, totaled 475,000 cases.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1956, with Comparisons

Type of Stocks	Unit	1955/56 Season					1954/55 Season				
		7/1/56	6/1/56	4/1/56	1/1/56	11/1/55	7/1/55	6/1/55	4/1/55	1/1/55	11/1/54
Distributors	1,000 actual cases	154	160	268	326	354	235	n.a.	331	n.a.	n.a.
Canners	1,000 standard cases[1/]	315	64	152	475	625	723	575	715	1,239	1,410

1/ 100 3¼-oz. cans equal one standard case. n. a. - not available.

The Maine sardine pack April 15 (the beginning of the season) to July 1, 1956, totaled 473,000 cases, which added to an April 15 carryover of 120,000 cases gave a total available supply at the canners' level of 593,000 cases. On December 1, 1955, the carryover was 690,000 cases, plus the pack for 1955 of 1,255,000 cases, gave a total available supply of 1,945,000 cases for the 1955/56 marketing season compared to an available supply of 2,875,000 cases for the 1954/55 season.

Maine

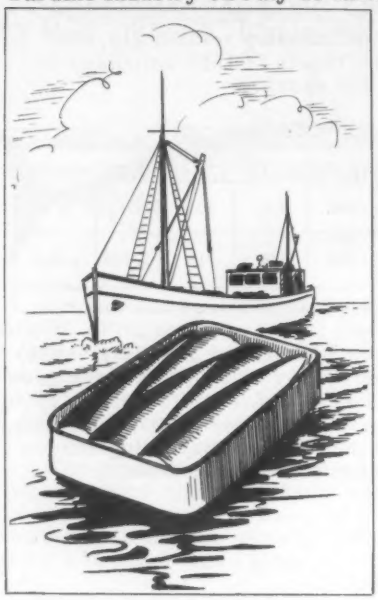
LANDINGS OF FISHERY PRODUCTS, 1955: During 1955 over 255 million pounds of fishery products, valued at more than $16 million ex-vessel, were landed at Maine ports. This represented a decrease of 28 million pounds or 10 percent in quantity and 772 thousand dollars or 5 percent in value as compared with the previous year. Compared with 1954, herring landings (99.4 million pounds) decreased 24 million pounds and ocean perch receipts (67.7 million pounds) decreased nearly 12 million pounds. Whiting landings (25 million pounds) increased almost 16 million pounds during the year. Landings at Portland totaled 68.2 million pounds valued at 2.3 million dollars during 1955 while Rockland landings amounted to 48.8 million pounds valued at 1.6. million dollars in the same period. Three species, ocean perch, whiting, and sea herring, made up 85 percent of the quantity of finfish landed and 77 percent of the value. Comparable figures for 1954 were 83 percent in quantity and 78 percent in value. In the shellfish group, lobsters contributed 81 percent of the quantity and 82 percent of the value as compared with 76 percent in quantity and 78 percent in value in 1954.

Maine's Landings of Fishery Products, 1954-55

Species	1955		1954	
	1,000 Lbs.	$1,000	1,000 Lbs.	$1,000
Fish:				
Cod	2,467	141	3,252	192
Haddock	4,009	276	4,885	360
Hake, White	2,398	103	3,175	150
Pollock	5,052	125	4,127	103
Cusk	603	34	724	43
Halibut	134	37	91	29
Mackerel	1,011	79	473	60
Flounders:				
Gray sole	1,183	91	1,273	93
Lemon sole	17	1	2	-
Yellowtail	30	3	24	2
Blackback	918	66	1,191	93
Dab, sea	1,386	84	1,654	90
Ocean perch	67,685	2,577	79,671	3,206
Whiting	25,114	266	9,318	116
Wolffish	111	4	131	6
Shark	27	1	37	2
Tuna	26	3	3	-
Alewives	3,770	33	3,296	27
Herring, Sea	99,416	1,353	123,602	1,770
Smelt	137	30	107	25
Butterfish	177	16	20	2
Eels	33	6	11	2
Menhaden	4,016	42	5,877	47
Miscellaneous	7,610	62	12,496	101
Total Fish	227,328	5,442	255,440	6,348
Shellfish, etc.:				
Crabs	499	28	520	27
Soft clams	2,621	949	3,723	1,360
Hard clams	250	74	282	100
Lobsters	22,718	8,716	21,668	8,087
Oysters	3	2	6	4
Sea scallops	1,114	581	708	334
Mussels	105	3	81	2
Periwinkles	8	3	6	2
Sea urchins	58	2	55	3
Bloodworms	203	167	240	201
Sandworms	178	110	284	167
Sea moss	135	3	465	7
Miscellaneous	220	6	422	13
Total Shellfish, etc.	28,103	10,643	28,469	10,307
Grand Total	255,431	16,084	283,909	16,655

* * * * *

ADVERTISING CAMPAIGN LAUNCHED BY SARDINE CANNERS: The Maine Sardine Industry on July 21 launched a 13-week concentrated advertising and merchandising campaign in 10 southern states--Virginia, South Carolina, North Carolina, Georgia, Louisiana, Florida, Alabama, Tennessee, Mississippi, and Texas.



The Executive Secretary of the Maine Sardine Industry said that newspapers would be used in 47 cities plus a schedule of more than 18,000 radio spots over 97 stations in 70 cities. He stated that the advertising would be supported by an aggressive merchandising program.

The theme of the campaign will feature "Sardines from Maine or Maine sardines in the familiar flat can that you and your folks have been buying for years" as an all-around low-cost convenience food.

The Executive Secretary said that the Industry enjoyed almost a 100 percent retail food-store distribution in the 10-state area and that the activity was designed to "further develop this big and important market."

A similar campaign is planned for the winter-Lenten period, he stated.

* * * * *

SARDINE INDUSTRY DEVELOPMENT PROGRAM: New England and New York bankers were given a first-hand look at the Maine sardine industry in July. They not only toured a couple of plants on the Portland waterfront, but were given a thorough briefing on the industry's 25¢-a-case State-financed development program. A total of 22 bank officials and 25 representatives of the various sardine-canning firms attended.

The bankers were told that they had been invited so they could be concisely and expertly informed of developments which have "caused competent outside observers to state that the industry has made more advances in the fields of processing, quality control, and merchandising in the past five years than in the previous eighty," states a July 26 release from the Maine Sardine Industry.

These were among the opening remarks of a member of the Council and President of the Maine Sardine Packers Association.

He emphasized that this program was made possible through the self-imposed tax which enabled the industry, by pooling its funds and problems, to have the same advisory and counseling services as are used by America's largest and most successful corporations.

The tax is collected from the packers by the State and expenditures are under the direction of a seven-man State-appointed Council of packers with disbursements being made through the office of the State Controller.

Asserting that the development work was becoming progressively beneficial to the packers, he added that it was also helping to bolster the economy of the State in general and especially the many communities which are largely dependent upon the sardine fishing and processing operations. He also felt that few industries in the United States were acting collectively to better effect and with such a unified approach as the Maine sardine canners.

A resume of the industry's scientific, technical, and grading research programs was given by the Research Director, who expressed high hopes that the use of a common grading system would do much to enable the packers to improve and modernize their product. He also told of several applications of new scientific developments which might, after further investigation, produce better control of processing and possibly operating economies.

A New York auditing firm reviewed the industry's cost-research activities while a market research firm summarized the conclusions reached as a result of the industry's three-year market and research program. The industry's advertising agency illustrated the ways which market research was being put to use in planning the advertising campaigns for Maine sardines.

North American Wildlife Conference

MEETING TO BE HELD MARCH 4-6, 1957: Lloyd W. Swift, Technical Sessions program chairman for the 22nd North American Wildlife Conference, announces that chairmen have been selected for the six technical sessions of this forthcoming international conservation conference that will be held March 4-6, 1957, in the Statler Hotel, Washington, D. C., according to the Wildlife Management Institute, sponsor of these large annual meetings.

Swift, who is representing The Wildlife Society, the organization of professional fish and game workers that formulates the technical sessions program of these annual conferences, is Chief of the Division of Wildlife Management, U. S. Forest Service.

All persons having papers that merit consideration for presentation during the technical sessions program of this large international conference should send them to the appropriate session chairman before the deadline date, November 15.

The three-day North American Wildlife Conference consists of three general and six technical sessions. The General Session program committee has been meeting, and the complete conference program will be announced in the near future.

Among the technical sessions listed are: Marine and Coastal Resources (Chairman: Clarence P. Idyll, Marine Laboratory, University of Miami, Coral Gables, Fla.), March 5; Wetlands and Inland Water Resources (Chairman: Frank C. Bellrose, Jr., Illinois Natural History Survey, Urbana), March 4; and Conservation Education (Chairman: John D. Bulger, National Wildlife Federation, Route 2, Groton, N. Y.), March 6.

North Atlantic Fisheries Investigations

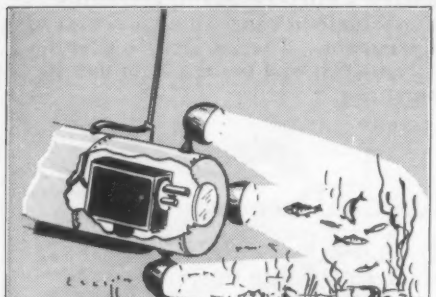
GEORGES BANK SEA SCALLOP BEDS SURVEYED BY M/V "ALBATROSS III" (Cruise 77): A survey of the sea scallop beds of Georges Bank by means of dredging and underwater photography and the tagging of as many scallops as possible was the purpose of Cruise 77 (July 5-11, 1956) of the Service's research vessel Albatross III.

A total of 22 stations were occupied with the 11-foot scallop dredge. All scallops were measured and 2,075 of them were tagged and released. Drops of tagged scallops were made at 10 different locations.

Heavy winds and sea restricted the use of the underwater camera. Photographs (250 individual pictures) were taken at six stations, however.

* * * * *

UNDERWATER TELEVISION AND COMMUNICATIONS TESTED BY M/V "ALBATROSS III" (Cruise 78): In order to test underwater television chain, underwater communications, and related equipment the Service's research vessel Albatross III operated in Buzzards Bay on July 16-17.



Artist's conception of equipment for underwater television.

Several lowerings of the camera were made with the assistance of SCUBA divers in 40-45 feet of water. Several additional lowerings were made to depths of 100 feet without the assistance of divers.

The underwater communications system developed at the Service's Woods Hole Biological Laboratory performed excellently in the tests.

Extreme turbidity restricted tests of the range of visibility and resolution of the camera. Sufficient natural illumination was available for operation to depths of 80-90 feet.

Stable operation of the television equipment resulted from the use of a portable 60-cycle gasoline generator.

* * * * *

TAGGING IN GULF OF MAINE BY M/V "T-79" (Cruise 2): Tagging in the Gulf of Maine was the purpose of the Service's research vessel T-79 cruise 2 (June 28-July 14, 1956). The cruise was carried out in three phases using Gloucester, Mass., as the base of operations. Phase I covered the period June 28-July 2; phase II took place July 4-9; and phase III was completed July 10-14.

Thirteen sets were made, each consisting of two tubs of line-trawl gear. Frozen herring and frozen squid were used as bait. Haddock were tagged with the following types of tags:

Petersen discs--white, yellow; through the gill cover or through the back in front of the first dorsal fin.

Lea bridle--in front of the first dorsal fin.

Combination tag using a Lea hydrostatic connected to an internal anchor.

Stainless steel pins and wire were used to fasten the disc tags.

Cod and halibut were tagged with the combination tags only. Dogfish were tagged with Petersen discs through the nose or through the dorsal fin.

Scales for age and growth analysis were taken from haddock tagged during phase III.

A total of 259 haddock, 138 cod, 120 dogfish, and 12 halibut were tagged.

North Atlantic Herring Research

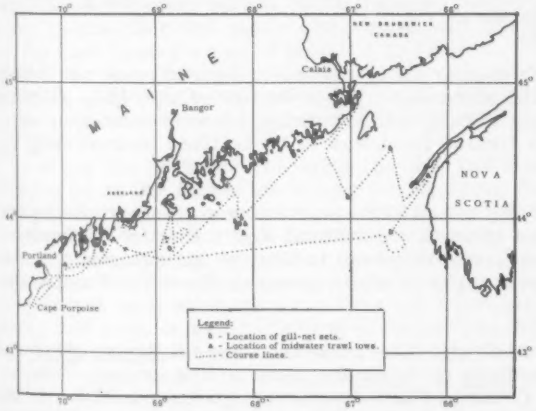
SHOAL WATERS NEAR ISLANDS EXPLORED FOR HERRING OFF MAINE AND CANADA BY M/V "METACOMET" (Cruise 4): Fishing and fish-finder soundings for herring were continued on Cruise 4 by the Service's chartered exploratory fishing vessel Metacomet in United States waters of the Gulf of Maine from Cape Porpoise to Eastport, and in the Canadian waters of Grand Manan Island, Grand Manan Shoals, St. Marys Bay, and Lurcher Shoal.

Emphasis was placed on exploring and sampling the shoal waters near islands and rocks offshore for herring in an effort to gain more information concerning the occurrence and distribution of this species in and near areas where sardine-size fish were still reported scarce or absent at the time of this cruise which began July 10 and ended July 21.

Herring gill-net sets and tows with a British Columbia-type midwater trawl were made at the points indicated in the chart.

Metacomet, vessel chartered by the Fish and Wildlife Service to continue program of exploratory fishing and gear development for the Maine herring.

Three bushels of herring were taken in 4 half-hour to one-hour tows of the midwater trawl near Petit Passage in St. Marys Bay, Nova Scotia. The fish taken in these tows were herring brit which averaged 2.1 inches and sardine-size herring of 4.7 inches average length. The larger fish comprised nearly all of the 3-bushel catch. A good showing of herring was observed on the fish-finder throughout the night in this area. Small quantities of large herring ranging in size from 8.0 inches to 14.0 inches were taken in gill nets at Fisherman Island near Boothbay Harbor, at Mt. Desert Rock, at Yellow Head Island and Howard Cove in Machias Bay, and off Old Proprietor Whistle Buoy on the southeast side of Grand Manan Island. The best showings of herring were observed on the fish-finder at Mt. Desert Rock, in Machias Bay, and in St. Marys Bay.



U. S. Fish and Wildlife Service Cruise 4 of chartered vessel M/V Metacomet.

A good showing of fish near the surface was observed between Pemaquid Point and Seguin Island the evening of July 20. A sample obtained with the midwater trawl established these fish as whiting.

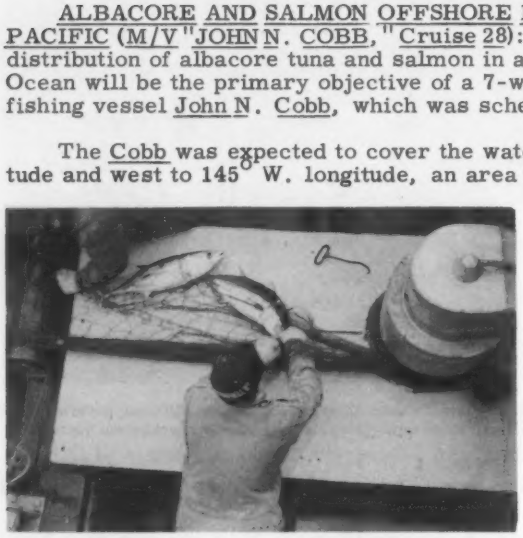
The Metacomet was expected to depart on Cruise 5 on July 31, 1956, for 11 days. Coastal and offshore waters of the Gulf of Maine were to be explored with

the fish finder and fished for herring in an effort to learn more of the occurrence of these fish at this season. Gill nets and a midwater trawl were to be used.

North Pacific Exploratory Fishery Program

ALBACORE AND SALMON OFFSHORE DISTRIBUTION STUDIES IN NORTH PACIFIC (M/V "JOHN N. COBB," Cruise 28): Offshore gill-netting to determine the distribution of albacore tuna and salmon in a section of the northeastern Pacific Ocean will be the primary objective of a 7-week cruise by the Service's exploratory fishing vessel John N. Cobb, which was scheduled to leave Seattle on July 16, 1956.

The Cobb was expected to cover the waters from 42° N. latitude to 50° N. latitude and west to 145° W. longitude, an area from the Oregon-California border to northern Vancouver Island extending up to 800 miles offshore, an area approximately 300,000 square miles.



Removing albacore from the gill net. Roller at right takes off from the main winch.

Landing of albacore in Washington and Oregon reached an all-time high of 34 million pounds in 1944, but fluctuated greatly and declined to less than 3 million pounds in 1952. In recent years practically no albacore have been caught north of California. It is hoped that this year's coordinated research program will help to throw some light on the mysteries of albacore movements, distribution, and availability to the commercial fishermen.

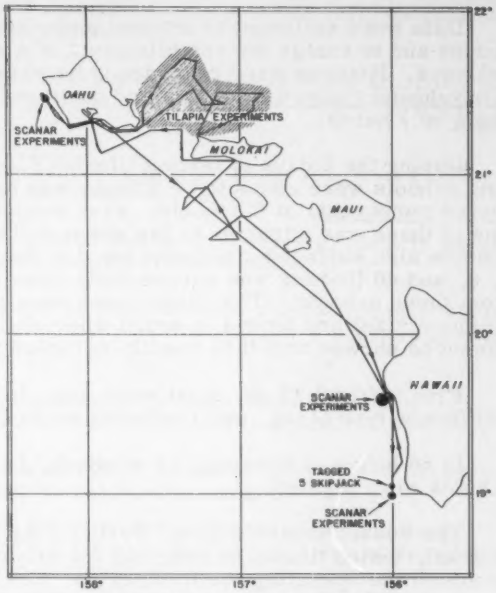
Nylon gill nets, ranging in mesh size from 3¼ inches to 8½ inches to catch both large and small salmon and albacore, were expected to be fished at night. Albacore trolling gear were to be fished during the day while running between stations. If schools of albacore are located, the fishing fleet was to be notified immediately by radio.

The salmon research is part of the broad high-seas salmon program being carried out this year by member nations of the International North Pacific Fisheries Commission. The catch will be frozen and returned to Seattle for scientific racial analysis and comparison with salmon caught in other areas of the north Pacific by other research vessels.

The University of Washington's oceanographic research vessel Brown Bear was to work in close conjunction with the John N. Cobb for most of the cruise. The John R. Manning, from the Pacific Oceanic Fisheries Investigations in Hawaii, was to operate north of Hawaii and west of 145° W. longitude. The three vessels will attempt to keep in radio contact at sea to exchange fishing information and other observations.

Pacific Oceanic Fishery Investigations

"CHARLES H. GILBERT" USES ELECTRONIC FISH FINDER TO SCOUT FOR TUNA (Cruise 29): The whereabouts and movements of Hawaii's skipjack and large tuna (aku and ahi) may soon be an open book to fishery scientists of the U. S. Fish and Wildlife Service, judging by the results of experiments recently carried out off the Island of Hawaii aboard the research ship Charles H. Gilbert using the vessel's new "Sea Scanar." This is a long-range sonic fish finder which detects fish under the water by bouncing sound waves off their bodies, picking up the echoes, and making them visible on a radarlike screen. According to the director of the Pacific Oceanic Fishery Investigations, the calm waters off the Kina coast of Hawaii were chosen as an ideal setting for testing the capabilities of the device on various natural and artifical targets and for training the scientific personnel who will use it to locate and track fish schools.



Charles H. Gilbert Cruise 29 (7/11-22/56).

The scientists aboard the vessel, reported that metal targets suspended under water were detected as much as 2,000 feet from the ship under favorable calm sea conditions. A dead skipjack tuna similarly suspended was spotted at a range of 1,000 feet, as was a much smaller herring, the well-developed air bladder of which acts as a resonating chamber and gives a strong echo of the fish-finder's sound waves. In addition to these "planted" targets, such natural features of the Kona seascape as schools of skipjack, dolphinfish (mahimahi), blackfish (a small whale), and porpoise were picked up and studied on the fish finder.

When the technique of using the new instrument has been worked out, it will be employed by the fisheries scientists studying the tuna resources of the central Pacific to locate schools of tuna which do not betray their presence by signs on the surface of the ocean. At present the researchers, like the commercial fishermen, are almost entirely dependent on sightings of bird flocks over feeding schools to lead them to fish. It is suspected, however, that there may be large concentrations of skipjack and other tuna in areas far from land where sea birds are not very abundant, and even in active fishing grounds like the waters close to the Hawaiian Islands there may be many tuna schools which escape notice because they do not happen to be accompanied by flocks of birds at the times when fishing boats pass near them. If there actually are such hidden fishery resources within the area covered by POFI investigations, the fish finder should reveal them. It is expected, too, that the instrument will provide more exact knowledge of the magnitude of the schools of tuna that are at present located and fished by conventional methods, for it seems likely that for many schools the fish seen and taken at the surface may, like the visible part of an iceberg, represent only a small fraction of what is hidden beneath the sea.

During the cruise period of July 11 to 22, in addition to the special experiments off Kona, the vessel scouted for tuna sonically and by conventional methods between Hawaii and Oahu and around the islands of Molokai, Lanai, and Maui.

Experiments conducted with the "Sea Scanar" to determine the maximum range of positive returns from various targets gave the following results: 24-inch stainless steel triplane (each plane a circle of 24-in. diameter)--2,180 ft., 12-in. aluminum triplane (each plane a 12-in. square)--2,080 ft., 3-in. brass triplane (each plane a 3-in. square)--1,800 ft., 1 skipjack (20 lb., frozen)--1,020 ft., 1 herring (18 cm., dead)--1,100 ft.

Data were collected to determine the amount of sea return under various conditions and to enable the establishment of a sound search procedure. These await analyses. Returns were recorded from skipjack (Katsuwonus pelamis) and dolphin (Coryphaena hippurus) schools and porpoise (unidentified) and blackfish (Globicephala sp.) herds.

During the 2 days of testing tilapia (T. mossambica) as live-bait, 12 skipjack tuna schools were contacted. Tilapia was chummed at 9 schools and nehu (Stolephorus purpureus) at 8 schools. Five schools responded to the tilapia by surfacing. One of these was attracted to the stern of the vessel but no fish was caught. Five schools also surfaced after nehu but 4 of these were attracted to the vessel. Two, 5, 9, and 40 (fishing was purposefully terminated after 40) skipjack were caught from these schools. The tilapia used were generally 3 to 4 inches long (larger than optimum size) and tended to sound when chummed. Examination of the skipjack stomachs showed that they readily accepted the tilapia as food.

Five skipjack (5-lb. size) were tagged; 3 with plastic dart tags, 1 with the blue California-type G tag, and 1 with the white California-type G tag.

In 66 hours of scouting, 18 skipjack, 10 dolphin, 1 yellowfin, and 9 unidentified schools were sighted.

The vessel departed Pearl Harbor July 11, 1956. In the vicinity of Oahu and Molokai, tested tilapia as live-bait for attracting skipjack on July 11 and 12. Determined the operating condition of the "Sea Scanar" off Waianae, Oahu, on July 13. Conducted "Sea Scanar" experiments off Kailua, Hawaii, from July 15-20. Scouted for fish schools en route to Oahu from Hawaii, July 20-22. Arrived Pearl Harbor July 22.

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REVIEW OF FISCAL YEAR 1956 OPERATIONS: The significant developments by the Service's Pacific Oceanic Fishery Investigations (POFI) during Fiscal Year 1956 (July 1, 1955-June 30, 1956) may be briefly summarized as follows:

Elucidation of a hypothesis to account for fluctuations and trends in the success of long-line fishing for yellowfin tuna in the Line Islands area of the central equatorial Pacific, based on a positive correlation between catch rate and water temperature.

Development of a new method of handling long-line gear to effect a saving of manpower.

Drastic curtailment of the program in the vicinity of the Line Islands and formulation of broad general plans to investigate the tuna resources in the area of the Marquesas, Tuamotus, and Society islands and eastward.

Initiation of an intensified skipjack tuna investigation aimed at explaining variation in fishing success in terms of meteorology, oceanography, and fish behavior.

Discovery of an apparent relationship between the summer skipjack catch and the prevalence of trade winds during the spring.

Demonstration that albacore tuna occurrence in the central North Pacific is associated with the Polar Front, which shifts seasonally and which may be regarded as a migration pathway.

Discovery of unfished albacore resources 200-500 miles off the coast of Oregon.

Evidence that the albacore, unlike the yellowfin, comprises one large population with its primary source in the western central Pacific.

The first recoveries of tuna tagged by POFI were made (including 2 albacore, 2 big-eyed, 12 skipjack, and 1 yellowfin tuna), thus justifying this method of studying tuna migration in the Pacific.

Initiation of a Pacific-wide cooperative albacore tagging program, with POFI sparking the venture in mid-ocean and off the coast of Japan.

Demonstration of the possible use of plankton indicator species to identify water masses and potential albacore waters in the central North Pacific.

Initiation of a worldwide tuna larva exchange program and acquisition of a worldwide collection of tuna larvae taken by the Dana, permitting a more positive approach to the problem of tuna larva identification.

Demonstration that yellowfin exhibit electrotaxis and that their movements can be directed with rather moderate power sources when suitably applied.

Successful participation in Norpac and Eastropic, synoptic cooperative surveys of the North Pacific and of the eastern equatorial Pacific, respectively.

Selection of POFI as the locale for a highly successful informal international conference for the exchange of Norpac data, planning the Norpac Atlas of results, and formulating plans for Equapac, a cooperative synoptic survey of the central and western equatorial Pacific.

Cooperation with other research agencies in conducting fishing surveys of the North Pacific, particularly with United States and Canadian agencies of the International North Pacific Fisheries Commission, in pooling resources for sampling the stocks of oceanic salmon and albacore.

Initiation of close collaboration with the University of Hawaii in terms of cooperative research, assistance in graduate training, and providing part-time employment for students. The latter is particularly important because it augments the supply of qualified fishery workers.

Equatorial Yellowfin Tuna: A program of year-round sampling of the yellowfin populations in the Line Islands area, initiated in January 1955, was completed this year. The results of this program show that long-line or deep-swimming tuna were generally scarce during the year. Catches fluctuated from 1 per 100 hooks to about 3 per 100 hooks with little indication of the seasonal variation evident in earlier years. The low availability of deep-swimming tuna was paralleled by a low availability of troll-caught surface tuna.

With respect to troll fish the highest catches were made during March and April. It was also evident that the catch rates of surface fish were higher in the northern Line Islands. These islands lie in or near the Countercurrent, an area that has been previously shown to support larger numbers of surface fish than the waters to the north and south.

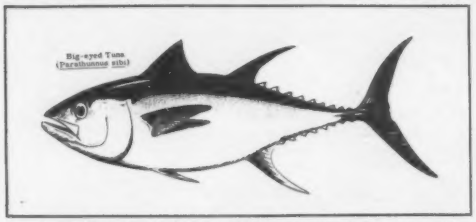
It is particularly significant to note that during this period of low yellowfin abundance water temperatures at Christmas Island were unusually low, that is, relative to the 1950-53 period, providing additional evidence supporting our hypothesis in respect to fluctuations in equatorial deep-swimming tuna. Briefly this theory proposes that near the equator cooler water indicates newly enriched water in which the biota to support a large yellowfin population has not yet developed. Conversely warmer water near the equator is thought to be upwelled water that has been in the euphotic zone long enough to develop a food supply for tuna. In this connection ocean water temperatures at Christmas Island station took an upward turn during the spring of 1956, suggesting that the environmental conditions associated with the high level of abundance during this period 1950-53 may reassert themselves this year.

Incidental to the study approximately 1,000 yellowfin tuna were tagged during the course of the one year program. To date there has been but a single recovery, a yellowfin tagged and recovered at Fanning Island. The fish had been at liberty for

six months prior to its recovery on April 3, 1956. This single recapture is of considerable interest in that it supports the contention that there are small localized populations of yellowfin tuna associated with each of the small islands in the central Pacific.

The central Pacific program is essentially complete, and future effort will be focussed on the Marquesas and eastward. As time permits, observations designed to test the hypotheses outlined will be completed.

Hawaiian Skipjack Distribution and Abundance: A major effort this year has been the initiation of a detailed program designed to ascertain the ecological requirements of skipjack and the factors in the ocean responsible for their presence and absence, both seasonally and geographically. The program involves measurement and analysis of hydrographic factors, and measurement and analysis of plankton in terms of level of abundance and distribution in the ocean. Major reliance is being placed on the Hawaiian commercial fishery for information on the distribution and abundance of skipjack in space and time. In this connection analyses have been initiated on the statistics of the local catch, utilizing small areas and short periods of time as sampling units. In order to encourage maintenance of good records, brochures have been prepared and distributed to skipjack fishermen, introducing them to the general program and soliciting their support.



An additional phase of the skipjack program is examination of existing oceanographic and meteorological material in order to ascertain the reasons for annual fluctuations in the supply of skipjack. A preliminary hypothesis has been developed based on the relationship between the wind flow over the island area and the skipjack catch. Briefly there is a high, positive correlation between the amount of catch during the summer or "season" months and the direction and strength of the winds during the late spring. It appears that the winds may affect the environment of the skipjack through their control of oceanic circulation. The hypothesis appears to form a valuable starting point for exploring this question of annual fluctuation, which is so important to the Hawaiian fishery as well as to similar fisheries elsewhere.

In order to learn something of the migrations and growth of skipjack, a total of 945 fish were tagged in Hawaiian waters with California-type spaghetti tags. To date there have been 12 recoveries; 9 recaptured by live-bait fishing and 3 found in the stomachs of long-line caught big-eyed tuna and yellowfin tuna taken by commercial fishermen around Hawaii. The recoveries have indicated rather limited movement, the maximum net distance traveled being about 40 miles. All but one of the fish were out for less than 3 months. However, one was at liberty for slightly over 8 months and during this period grew about 7 pounds. This growth rate agrees very well with past studies on the growth of Hawaiian skipjack based on size-frequency analysis.

As implied above, the modified and augmented skipjack program is only a few months old. At least one year's work is needed for a preliminary evaluation of the results.

North Pacific Albacore Program: One objective of this program is to explore the area north and east of the Hawaiian Islands for potential fishing grounds and to collect basic chemical and physical data to use in the analysis of our fishing results. The second has been to work "upstream" of the American coastal albacore fishery to investigate the biological and physical causes of the violent fluctuation in the catches of this fishery. In support of these studies, investigations are also being made of the oceanwide distribution of albacore, albacore growth rate and spawning, races of albacore, North Pacific weather, and the distribution of plankton.

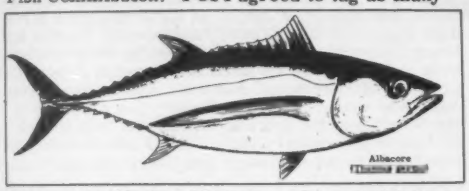
As in the past, in order to obtain the most efficient use of available vessels and personnel, POFI cooperated closely with other agencies in the planning and execution of the field program. Formal coordination of the exploratory fishing program with those of research agencies of the Pacific states was through the Albacore Steering Committee. Informal cooperation through the Eastern Pacific Oceanic Council resulted in Norpac, a quasi-synoptic physical, chemical, and biological survey of the North Pacific during July and August 1955, which involved vessels from the United States, Canada, and Japan. A significant contribution to the summer distribution of albacore was also made by U. S. Fish and Wildlife Service vessels surveying the salmon distribution during July-September 1955 when they fished far enough south to show the northern limit of albacore in mid-ocean.

Three exploratory fishing cruises were made during the year to determine the distribution and abundance of albacore to the north and east of the Hawaiian Islands.

The surveys during the past have been directed primarily towards determining the limits of distribution of albacore tuna and associated environmental factors. As data have been accumulated and analyzed emphasis has shifted from subsurface to surface fishing and the principal gear to be used in the future will be the gill net supplemented by trolling. It is hoped that the results obtained by these fishing methods will enable us to define the areas of commercial abundance.

Data concerning catch rates and length frequencies of albacore tuna were compiled from all possible sources in the literature in order to form the basis of a working hypothesis for their distribution and abundance in the North Pacific. The data were not extensive but they seem to indicate that there is a single population of albacore which has its primary nucleus and source in the waters of the islands of the western central Pacific. Literature search and analysis of this type of data will be continued.

Through the Albacore Steering Committee POFI has encouraged a Pacific-wide albacore tagging program, the general objectives of which are to more clearly define the migratory routes of the albacore and to clarify the relationships between the fish taken on both sides of the Pacific and within the central Pacific. Continuing its pioneering program, during 1956 the California Department of Fish and Game agreed to tag some 2,000 fish off the West Coast with the assistance of the Oregon Fish Commission. POFI agreed to tag as many



fish as possible in midocean, and to provide tags for the albacore that might be caught during salmon research cruises of vessels of Canada, the U. S. Fish and Wildlife Service, and the University of Washington. In addition, in May a team of two POFI biologists was sent to Japan to tag albacore and to instruct Japanese technicians in tagging methods. There was considerable interest in this work and through the excellent cooperation of the Japanese, the POFI representatives tagged 270 albacore off the coast of Japan. Based on this experience the Japanese are planning to tag 2,000 albacore during the spring of 1957.

Since the inception of the albacore program POFI has tagged and released 201 albacore and 82 big-eyed tuna in the central North Pacific. Four recoveries were reported this year, 2 of albacore and 2 of big-eyed.

Economical Means of Harvesting Tunas: A new method for handling cotton long-line gear was developed during the year. This method involves flaking down a continuous mainline into a large tub rather than breaking the gear into individual baskets. Using this method we have been able to rather easily fish up to 1,000 hooks a day. Though there were 11 men on the fishing vessel, it appeared that this amount of gear could have been rather easily fished by 6 men. This indicates a more efficient operation than that of Japanese commercial fishermen who fish around 2,000 hooks with crews of 25 to 30 fishermen. Further tests of this method are needed before it can be stated with certainty that it has commercial possibilities. However, all indications to date are favorable.

Steel gear, which had been tested earlier, was finally shown to be rather inefficient when applied to tuna long-line fisheries. Though it, too, holds promise of getting more hooks in the water with fewer men, there are rather severe problems associated with its use. For one thing, steel is expensive and does not last long in the field because of excessive kinking under the strain of holding heavy fish. Perhaps even more important, however, the steel gear does not appear to capture tuna as efficiently as cotton gear. There is evidence to indicate that this is because of its lack of resiliency and its failure to provide a drag on the fish's struggle to escape.

Sonic Ranging: A new and potentially promising sonic scanning device was received in December. To date most of the effort has been devoted to ironing out bugs in design and construction. It appears we are now in a position to (a) learn how to use it effectively, and (b) apply it where pertinent to our present studies on tuna behavior and distribution.

Contract Research: Contracts with the University of Hawaii enable us to utilize the services of experienced faculty researchers in specialized fields of biology, physics and chemistry in coping with basic research problems of importance to our program. Three projects were actively pursued during the year as follows:

TUNA VISION: This project, started in June 1955, stemmed from our unsuccessful attempts to devise a substitute for tuna livebait, our observation that vision was the predominant sense in tuna feeding, and our belief that fundamental research on vision might suggest a new approach to the solution of the tuna bait problem. The objectives for the first year were (a) to determine if there were anatomical or morphological differences in the eyes of different sizes and species of tuna which might be associated with different habits and habitats, and (b) to determine the optical potentials of the tuna eye. Comparison of the eyes of small and large skipjack (surface fish) with large yellowfin (deep-swimming fish) so far has revealed no basic differences in shape, structure, musculature, or retinal mosaic pattern, despite the difference between species in habit and habitat. Fresh whole eyes, with an artificial opaque viewing screen covering an aperture in the retinal-chorioid layer, and a movable pin-point light source were immersed in a long trough of sea water to determine the distance of acute vision. Problems arose because of variation in the position of the lens at rest and the difficulty of devising an apparatus to move the lens and thus to simulate accommodation. These problems have not been solved as yet. A new contract for a comparative histological study of the retina of different tuna species, with special emphasis on the distribution and ratio of the rods and cones was initiated June 1, 1955.

ELECTROFISHING: An investigation of the possibility of using electrotaxis as a means of harvesting tuna was continued. Last year, based on preliminary experiments with aholehole in a small tank, an apparatus was devised which theoretically should create an electric field sufficient to control the movements of tuna in a large concrete tank, 35x11x4 feet in size. The apparatus, employing pulsed D. C. generated by intermittent charging and discharging of a bank of condensers and powered by 10 6-volt storage batteries, was tested on tuna and other fish during the year. With this apparatus, it was possible to control the movements of 8- to 10-pound yellowfin over a distance of 16 feet, using a frequency of 18-20 cycles per second. These results are regarded as highly significant (a) because they are the first demonstration that tuna respond electrotactically, (b) because of the relatively low power source, and (c) because of the probability that the dissipation of energy in the well-grounded tank was comparable in magnitude to that which would be encountered in the open sea. However, the principle

of condenser discharge was not pursued further because of problems which would be encountered on board ship in devising a satisfactory mechanical or electronic current interruptor. Rather, attention was directed to the possibility of using a modified amplidyne-generator assembly to produce a field of sufficient strength between widely spaced electrodes to control the movements of tunas in the open sea. Preliminary experiments on modifying available generator units have shown promising results. The 1955 contract was extended to August 31, 1956, to complete this phase of the study.

OFF-COLOR TUNA: In initial attempts at commercially fishing the yellowfin tuna resources discovered in the central equatorial Pacific, a relatively large percentage of the catch was rejected at the cannery because of a "green" or "off-color" condition which developed during processing. Contract work was undertaken to identify the pigment responsible for this condition and to determine the chemical processes involved. In other words, the project was aimed at providing basic information which might be useful to industry in their problem of identifying the incipient condition in raw fish and in preventing its appearance during processing. It was found (a) that in raw fish the pigment associated with incipient "greening" was a peroxidase-like or myoglobin-like heme-protein, (b) that oxidation of this pigment is involved in the formation of the condition, (c) that substances, such as ascorbic acid, which may act as reducing agents, tend to inhibit the condition, and (d) most important, that the "green" appearance following precooking is not due to the production of a green pigment, but rather is due to an abnormal lack of reddish pigmentation. These fundamental studies are being followed with great interest by technologists both in Hawaii, on the mainland, and in Japan. The problem of "greening" has been encountered in the Japanese winter long-line fishery for albacore in the North Pacific and may become of importance to American industry should large albacore be encountered between Hawaii and the mainland.

A new contract continuing the study of "off-color" tuna was negotiated June 1, 1956.

Public Eating Places Survey

FISH AND SHELLFISH QUALITY STANDARDS NEED RECOGNIZED BY MOST EATING PLACES: Two-thirds of all the operators of public eating places serving fish and shellfish in the United States who expressed an opinion on the question "Do you believe that there is a need for grade or quality standards for the fish and shellfish you buy?", indicated that grade or quality standards are needed. About 1 out of 5 who were asked the question were undecided. When the establishments are classified on a regional basis, the opinions are quite similar to those found for the United States as a whole. The findings are based on a scientific sample survey of 4,500 establishments representative of all public eating places in the United States, including 208,000 serving fish and shellfish.

Recognition of Fish and Shellfish Quality Standards Need by Public Eating Places Serving Fish or Shellfish, by Geographic Region

Geographic Region	All Public Eating Places		Need Grade or Quality Standard		Do Not Need Grade or Quality Standard		Do Not Know		No Reply	
	No.	%	No.	%	No.	%	No.	%	No.	%
United States Total	208,100	100.0	105,200	50.6	52,100	25.0	46,700	22.4	4,100	2.0
By Region:										
Northeast	68,000	100.0	33,700	49.5	16,500	24.3	17,200	25.3	600	.9
North Central . .	59,700	100.0	29,700	49.8	17,400	29.1	10,900	18.3	1,700	2.8
South	45,900	100.0	22,900	49.9	10,800	23.5	10,900	23.8	1,300	2.8
West	34,500	100.0	18,900	54.8	7,400	21.5	7,700	22.3	500	1.4

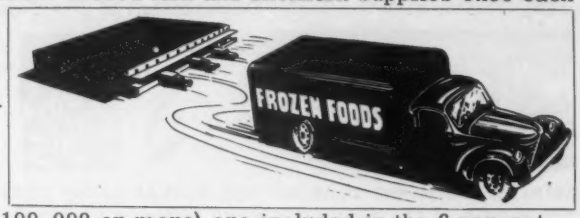
Final results of the survey, which is being financed by funds made available under the Saltonstall-Kennedy Act of 1954, are scheduled for publication this year.

* * * * *

FREQUENCY OF FROZEN FISH AND SHELLFISH SALES TO EATING PLACES: According to the results of a scientific sample survey of 4,500 establishments representing all public eating places in the United States, most of them order frozen

fish and shellfish supplies weekly. Many of them, however, order supplies daily; others as infrequently as once a month.

Almost 90,000, or 43 percent, of the 208,000 public eating places serving fish and shellfish in the United States order frozen fish and shellfish supplies once each week. About 16 percent order supplies every 2 to 4 days. Another 9 percent place orders for fish and shellfish 1 to 3 times a month. Only 6 percent of the public eating places order supplies daily.



Many of the larger restaurants (annual sales from food of $100,000 or more) are included in the 6 percent ordering frozen fish and shellfish daily. About 30 percent of these large restaurants order daily and an additional 34 percent order 2 to 4 times a week. Only 16 percent of these restaurants order on a weekly basis.

Frequency of Frozen Fish and Shellfish Sales to Public Eating Places

Item	All Public Eating Places		Every Day		2 to 4 Times A Week		Once A Week		2 or 3 Times A Month		Once A Month		Less Than Once A Month		Whenever Needed		No Reply or Not Applicable	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
United States Total	208,100	100.0	12,900	6.2	32,600	15.7	89,800	43.1	10,000	4.8	7,700	3.7	2,700	1.3	12,000	5.8	40,400	19.4
By Region:																		
Northeast	68,000	100.0	4,300	6.3	8,000	11.8	26,800	39.4	2,500	3.7	2,500	3.7	1,100	1.6	4,300	6.3	18,500	27.2
North Central	59,700	100.0	3,200	5.4	8,800	14.7	32,900	55.1	2,700	4.5	2,600	4.4	600	1.0	2,800	4.7	6,100	10.2
South	45,900	100.0	2,800	6.1	8,500	18.5	17,900	39.0	1,800	3.9	1,700	3.7	600	1.3	3,600	7.9	9,000	19.6
West	34,500	100.0	2,600	7.5	7,300	21.2	12,200	35.4	3,000	8.7	900	2.6	400	1.1	1,300	3.8	6,800	19.7
By Type of Establishment:																		
Restaurants	105,700	100.0	6,900	6.5	17,900	16.9	50,300	47.6	4,700	4.5	3,600	3.4	1,400	1.3	5,600	5.3	15,300	14.5
Cafeterias	4,300	100.0	200	4.6	800	18.6	2,200	51.2	100	2.3	100	2.3	-	-	300	7.0	600	14.0
Restaurants or cafeterias in hotels	15,300	100.0	3,500	22.9	3,100	20.2	4,900	32.0	700	4.6	300	2.0	-	-	600	3.9	2,200	14.4
Drug or proprietary stores with fountain service	9,800	100.0	300	3.1	800	8.2	2,500	25.5	1,500	15.3	700	7.1	100	1.0	100	1.0	3,800	38.8
Other1/	73,000	100.0	2,000	2.7	10,000	13.7	29,900	41.0	3,000	4.1	3,000	4.1	1,200	1.6	5,400	7.4	18,500	25.4
By City Size (Population):																		
500,000 or more	42,600	100.0	3,600	8.5	6,500	15.3	16,400	38.5	1,500	3.5	900	2.1	400	.9	2,100	4.9	11,200	26.3
100,000 to 499,999	26,100	100.0	3,700	14.2	5,600	21.4	9,200	35.3	800	3.1	1,100	4.2	400	1.5	1,300	5.0	4,000	15.3
25,000 to 99,999	27,400	100.0	2,100	7.7	4,400	16.1	13,100	47.8	1,200	4.4	800	2.9	400	1.4	900	3.3	4,500	16.4
2,500 to 24,999	39,900	100.0	1,600	4.0	6,000	15.0	18,500	46.4	2,000	5.0	1,700	4.3	400	1.0	3,700	9.3	6,000	15.0
Less than 2,500	72,100	100.0	1,900	2.6	10,100	14.0	32,600	45.2	4,500	6.3	3,200	4.4	1,100	1.5	4,000	5.6	14,700	20.4
By Annual Sales Size (from Food):																		
$100,000 or more	15,300	100.0	4,600	30.1	5,200	34.0	2,500	16.3	400	2.6	100	.7	100	.7	1,000	6.5	1,400	9.1
$ 40,000 to $99,999	24,800	100.0	3,000	12.1	5,900	23.8	11,200	45.2	1,100	4.4	100	.4	200	.8	800	3.2	2,500	10.1
$ 10,000 to $39,999	62,600	100.0	2,700	4.3	10,000	16.0	32,400	51.8	3,000	4.8	2,300	3.7	600	.9	2,500	4.0	9,100	14.5
Less than $10,000	91,600	100.0	1,500	1.6	9,900	10.8	38,300	41.8	4,800	5.2	4,600	5.0	1,700	1.9	7,000	7.7	23,800	26.0
No reply	13,800	100.0	1,100	8.0	1,600	11.6	5,400	39.1	700	5.1	600	4.3	100	.7	700	5.1	3,600	26.1

1/ Includes drinking places, lunch counters, and refreshment stands.

According to the survey the availability of storage facilities for frozen fish and shellfish and the distance of the supplier from the public eating place are not the important factors which determine how frequently supplies of frozen fish and shellfish are ordered. One factor which may have an effect on deliveries is the number of days a week fish and shellfish are included on the menus. There is some indication that many public eating places still offer fish and shellfish meals on Friday only, while most of the larger restaurants offer fish and shellfish more often.

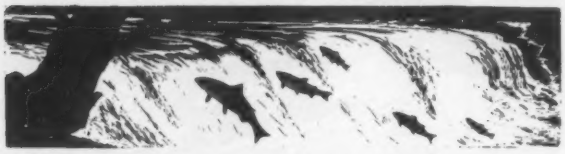
The survey is financed by funds made available under the Saltonstall-Kennedy Act of 1954.

Salmon

COLUMBIA SALMON STUDY PLANNED FOR IDAHO STREAMS: Idaho's fabulous Salmon River, the "river of no return," haunt of "mountain men" and hardy fishermen, "top of the stream" for part of the Columbia River salmon and steelhead trout, and upper limit of the vast $23 million Columbia River salmon program, is due for special attention this year, according to Fred A. Seaton, Secretary of the Interior in an August 5 news release.

Initial funds up to $200,000 for the improvement of the Salmon River and possibly the Clearwater River, for salmon and steelhead production, are available this year for expenditure on approved projects.

A preliminary survey of needed improvements on the Salmon will begin soon in cooperation with the Idaho Department of Fish and Game under the Columbia River Fisheries Development program. This is a cooperative program with the States of Oregon, Washington, and Idaho.



At the present time there are no dams on the Salmon River which interfere with the runs but one dam is under construction on the Snake River below the mouth of the Salmon River. This is at Ice Harbor, not far from where the Snake River joins the Columbia. There are possibilities, however, of major dams at the Lower Monumental, Little Goose, and Lower Granite sites, all below the mouth of the Salmon River.

On the Columbia River itself below the mouth of the Snake River is the recently-constructed McNary Dam, the proposed John Day Dam, The Dalles Dam now under construction, and the Bonneville Dam which has been in existence since 1938. On the Columbia, also, are Grand Coulee and Chief Joseph dams, 600 miles from the sea, too high for fish ladders or elevators. Chief Joseph marks the upper limit of the salmon run on the main river.

In 1949, when it was evident that dams constructed or proposed would seriously damage the salmon and sea-run trout fisheries, Congress authorized the current salmon program which, when completed, will include 30 hatcheries (seven of which are in existence and being remodelled), more than 30 fishways and numerous stream clearance projects. These developments are designed to hold salmon and steelhead production at the highest possible level, although maintenance of the current production of 32 million pounds annually will also depend on continued availability of upriver spawning areas.

Of the 30 hatcheries, 8 will be operated by the Fish and Wildlife Service, 13 by Oregon, and 9 by the State of Washington. The total cost of the entire program will be about $23,000,000 of which $11,451,000 had been made available by the Congress before July 1, 1956. Of this amount, Washington has been apportioned $4,291,000; Oregon, $3,404,000; and the Fish and Wildlife Service, $3,756,000. For the 1957 fiscal year, $1,400,000 is available for construction and $1,250,000 for operation and maintenance.

Under the program the natural spawning beds, like those of the Salmon River and elsewhere, will be utilized to the fullest extent. Streams, which because of numerous natural obstructions have not supported salmon runs for years have been cleared and new runs established. Hatcheries supply young fish to supplement the natural spawning results and for the reestablishment of runs. Fish ladders have been installed over dams and waterfalls. Fish screens have been placed at irrigation headgates to prevent loss of downstream migrants. Similar activities now will be undertaken in Idaho streams accessible to salmon and steelhead trout.

Special problems relative to fish ladders and screens are being studied by biologists who are improving fishway design and developing electrical guidance apparatus which, when perfected, will increase the efficiency of the fishways and drastically cut the losses in downstream migrants. These studies are among regular and continuing Service programs in cooperation with the Corps of Engineers and the fisheries agencies of Oregon, Washington, and Idaho.

Saltonstall-Kennedy Act Fisheries Projects

AMERICAN FISHERIES ADVISORY COMMITTEE TO MEET IN CHICAGO: A special meeting of the American Fisheries Advisory Committee will be held on October 11 and 12, 1956, in Chicago, Ill. This meeting has been called because of the recent passage of the Fish and Wildlife Act of 1956, which provides, in part, for the extension of the Saltonstall-Kennedy Act on a permanent basis, and makes available annually hereafter the full 30 percent of the duties on imported fishery products, thereby removing the former $3,000,000 annual expenditure limitation of these funds.

Shrimp

DYEING LATEST AID IN TAGGING: Shrimp with heads of pastel colors are not dreams nor are they passing fads or fancies for the biologists of the Institute of Marine Science of the University of Texas, working on a U. S. Fish and Wildlife Service research project, have discovered a safe, sure, easy, way of identifying shrimp for study.

The biologists have found that certain dyes introduced into a shrimp's body by hypodermic needle or food will color the head of the shrimp but will not color the edible portions. The dye persists in the heads for several months. Various colors can be used, with the hypodermic needle method of introducing dye into the shrimp providing the wider selection.

This solves a problem which has been hampering scientific studies of shrimp for decades. Because shrimp molt periodically as part of the process of growth, the usual methods of tagging have only been partially satisfactory.

The identification work is part of a study of the movements and migrations of shrimp populations, which in turn is part of a comprehensive study of shrimp now being conducted by the Fish and Wildlife Service with funds supplied by the Saltonstall-Kennedy Act of 1954.

Another part of the research is being done by Tulane University where the first comprehensive anatomical study ever to be made of shrimp is being pursued. A third study is being made on the structure and chemistry of shrimp tissues at the Texas A. and M. Marine Laboratory while still another project to determine the effects of various environmental factors on shrimp is being made by the Fish and Wildlife Service biologists at Galveston, Tex.

Shrimp is America's largest fishery in terms of ex-vessel value--more than $70,000,000 a year--and most of the United States production is in the Gulf of Mexico. The purpose of the study, together with an enlarged statistical program, is to enable biologists and members of the fishing industry to maintain a watchful eye on the shrimp fishery in the interests not only of the more than 7,000 trawler owners and crews and the processors who depend upon shrimp fishing for a livelihood, but for millions of Americans who consider shrimp one of the finer foods.

South Atlantic Exploratory Fishery Program

GEAR RESEARCH ACTIVITIES BY M/V "GEORGE M. BOWERS" (Cruise 5): Gear research activities were the objective of a nine-day cruise of the Service's gear research vessel George M. Bowers during the period July 23 to July 31. These operations featured the use of divers using SCUBA gear, a controllable diving sled, movie and still-recording cameras, and underwater television in the shallower waters of Little Bahama Bank adjacent to Matanilla Shoal at 79°05' west longitude and 27°20' north latitude.

The Service's research vessel George M. Bowers.

During 16 diving operations emphasis was placed on observations of modifications to rigging of a 40-foot bottom trawl for use in experimental fishing operations on the bottom, off the bottom, and in midwater. By use of the diving sled it was possible to observe the trawls from all angles at distances ranging from approximately 50 feet to actual physical contact. Photographic recordings of the gear in action were taken during varied weather and light conditions.

It was determined that with minimum modification to placement of floats, lead line, trawl doors, and towing legs this particular trawl design was easily adaptable to experimental fishing just off the bottom or for midwater use.

During operations with the underwater television vehicle, an evaluation was made of a new and classified Vidicon television camera tube. A preliminary analysis indicated approximately twice the photosensitivity for the new tube as compared to commercially available equipment.

Fig. 2 - Exploratory fishing personnel aboard the George M. Bowers preparing to dive with SCUBA gear to observe action of shrimp trawls being towed on the bottom.

Two schools of tuna were sighted at Matanilla Shoal July 28 and July 29. During periods when lighting conditions were unfavorable to underwater operations, trolling was conducted at the 100-fathom contour. Seven blackfin tuna (Thunnus atlanticus) from 4 to 6 pounds each were taken. Gonad examinations revealed the female fish were nearly sexually mature.

The M/V George M. Bowers was scheduled to depart Miami August 14, 1956, for a 16-day experimental fishing cruise on the Tortugas shrimping ground. Principal objective will be to learn more of the occurrence and distribution of shrimp off the bottom and in midwater. On at least three previous cruises Service explor-

atory vessels have taken commercial species of shrimp when the trawl was not on the bottom. Fishing operation will be conducted with 40-foot commercial-scale gear modified for use off bottom and in midwater in bad bottom trawling areas.

Tuna

ALBACORE TUNA INVESTIGATION IN NORTH PACIFIC: The M/V Brown Bear, a University of Washington oceanographic research vessel sailed the latter part of July for a seven-week large-scale albacore tuna investigation in the offshore waters of the North Pacific. State and Federal agencies are cooperating in this albacore research which is being coordinated by the Pacific Marine Fisheries Commission, an agency created by a compact between California, Oregon, and Washington in 1947.

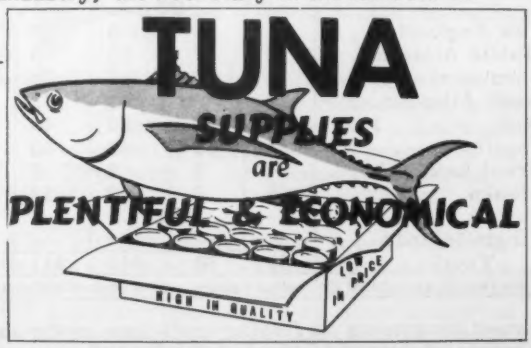
Some of the objectives of the cruise are: (1) investigation of factors such as water properties and abundance of plankton and other potential fish foods which may have an influence upon the distribution of albacore and salmon; (2) detection of possible changes in the above factors which might occur during a period of a few weeks, (3) collection of further information on the outflow of diluted water from the Columbia River and the Juan de Fuca system; (4) determination of the distributional pattern of any albacore which might be sighted in the area under observation.

During the 5,300-mile cruise, scientists aboard the Brown Bear will make observations at approximately 50 oceanographic "stations." The cruise will consist of two parts, with a port of call at Astoria about August 4. During portions of both parts of the cruise, the vessel will be operating in conjunction with the U. S. Fish and Wildlife Service exploratory fishing vessel John N. Cobb.

Plans have been made to rapidly forward to the tuna fishing fleet any information regarding schools of tuna which might be encountered during the course of the study. The Brown Bear will attempt to maintain radio contact periodically with the commercial fishing vessels in the general area.

* * * * *

INDUSTRY-GOVERNMENT SALES PROMOTION PROGRAM: In response to requests from the Pacific Coast tuna industry, the Secretary of the Interior announced July 24 that the Fish and Wildlife Service was giving full support to a joint industry-Government sales promotion program designed to move the plentiful supplies of canned tuna into normal trade channels.



The nationwide program, which was set up to move big stocks of canned tuna rapidly, was directed toward both institutional and home-consumer markets and reached a climax during the period of September 13 through 22.

Due primarily to excellent fishing this spring and summer, normally a season of light production, record stocks of canned tuna are available at the lowest price in several years. National advertising by the tuna industry and the emphasis of the tie-in features of canned tuna aided tremendously in the sales effort.

The Fish and Wildlife Service aided the industry's promotional efforts through special work with schools, institutions, and food-trade groups. Informational and educational activities were increased in order to attract greater consumer attention.

The Department of Agriculture cooperated through use of the facilities of the Federal Extension Service and the Food Distribution and Information Divisions of the Agricultural Marketing Service. Canned tuna in oil was included on the list of plentiful foods during September.

Canned tuna is available in a number of varieties. The solid pack consists of tuna loins packed in oil; the chunk pack, as the name implies, is a pack of chunks in oil; the grated pack is the grated or shredded portion of the tuna loin; the flake pack is the broken or mixed segments of the loin. A number of speciality packs are also available, such as "tonno" consisting of solid-meat tuna packed in olive oil; baby food packs, and others. For the past several years a "dietetic" pack has been prepared for those persons who must avoid salt in their diets. Practically all of these varieties are available in white or light meat.

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CANNERS PETITION FOR STANDARDS OF IDENTITY: The Department of Health, Education, and Welfare on July 18 was petitioned for standards of identity and fill of container for canned tuna by the National Canners Association along with 20 domestic canners of tuna. Accompanying the petition was information supporting the request and suggesting a proposed text for the standards.

United States Fishing Fleet[1/] Additions

A total of 89 vessels of 5 net tons and over were issued first documents as fishing craft in June 1956--29 more than in June 1955. The South Atlantic and Pacific areas led with 25 each, followed by the Gulf area with 17, and the Chesapeake area with 14, according to the U. S. Bureau of Customs.

Table 1 - U. S. Vessels Obtaining First Documents As Fishing Craft, by Areas, June 1956 and Comparisons

Area	June		Jan.-June		Total
	1956	1955	1956	1955	1955
	(Number)				
New England	1	3	9	10	18
Middle Atlantic	2	1	15	9	13
Chesapeake	14	9	43	24	54
South Atlantic	25	2	49	30	65
Gulf	17	13	55	48	103
Pacific	25	21	48	60	117
Great Lakes	-	3	2	5	9
Alaska	5	8	27	23	35
Hawaii	-	-	-	2	3
Virgin Islands	-	-	-	-	1
Total	89	60	248	211	418

Note: Vessels assigned to the various sections on the basis of their home ports.

Table 2 - U. S. Vessels Obtaining First Document as Fishing Craft, by Tonnage, June 1956

Net Tons	Number
5 to 9	42
10 to 19	17
20 to 29	14
30 to 39	8
50 to 59	1
60 to 69	1
100 to 109	1
110 to 119	1
120 to 129	4
Total	89

In the first six months of 1956, 37 more vessels were issued documents as fishing craft than in the same period of 1955.

1/ Includes both commercial fishing and sport fishing craft.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, APRIL 1956: Imports of edible fresh, frozen, and processed fish and shellfish for this April increased about 6.7 percent in quantity and 1.1 percent in value as compared with March 1956. Compared with April 1955 the imports for April 1956 increased 17.1 percent in quantity and 20.4 percent in value. The dollar value in April 1956 was close to 26.4 cents a pound, compared with 25.7 cents a pound in April 1955. The increases for April 1956 over the same month a year ago were due largely to higher imports of frozen fish fillets and canned fish.

United States Foreign Trade in Edible Fishery Products, April 1956 with Comparisons

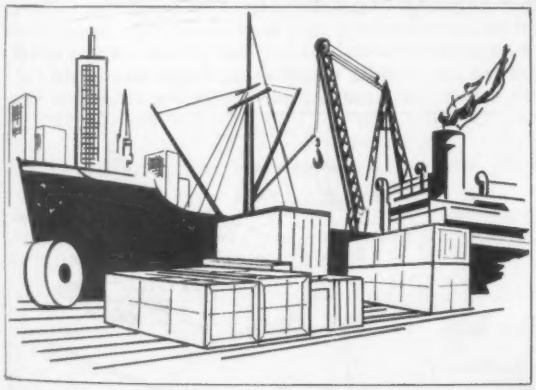
Item	Quantity			Value		
	April		Year	April		Year
	1956	1955	1955	1956	1955	1955
	(Million of Lbs.)			(Millions of $)		
Imports:						
Fish & Shellfish:						
Fresh, frozen & processed 1/	67.0	57.2	768.3	17.7	14.7	206.4
Exports:						
Fish & Shellfish: processed 1/ only (excluding fresh & frozen)	3.8	9.0	91.0	0.8	2.6	21.8

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

Exports of processed fish and shellfish in April 1956 decreased about 40 percent from the March 1956 total, and were also down 58 percent from April 1955. The value of exports in April 1956 declined 38.5 percent when compared with March 1956 and 69 percent below April 1955.

* * * * *

GROUNDFISH FILLET IMPORTS UP IN JULY 1956: United States imports of groundfish (including ocean perch) fillets during July 1956 totaled 16.1 million pounds--27 percent greater than in the corresponding month of last year (see chart 7 in this issue). The principal cause for this gain was a 4.6-million-pound increase in imports from Canada. Imports from Norway, Denmark, and Miquelon and St. Pierre were also somewhat greater. Icelandic groundfish fillet exports to the United States during July 1956 were down 1.5 million pounds as compared with exports reported for the preceding July. There were no imports from Sweden, United Kingdom, France, Japan, and the Union of South Africa during July 1956.



Canada continued as the chief exporter of groundfish fillets to the United States with 14.7 million pounds during July 1956--92 percent of the total fillet imports. Canada accounted for 80 percent of the groundfish fillet imports during the same month of 1955.

Total groundfish and ocean perch fillet imports during the first seven months of 1956 amounted to 82.6 million pounds--an increase of 7.4 million pounds or 10 percent as compared with the amount reported for the same period last year. Canada (59.5 million pounds) and Iceland (15.5 million pounds) led all other countries during the seven-month period of 1956--both accounting for 91 percent of the total.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MAY 1956: A comparison of United States imports and exports of selected fishery products during the first five months of 1956 with the same period of 1955 shows substantial gains in imports of canned tuna, salmon, and crab meat; fresh and frozen shrimp, groundfish fillets; and fish meal. There were declines in imports of canned bonito, fresh or frozen tuna, salmon, and blocks or slabs of groundfish fillets.

United States Foreign Trade of Selected Fishery Products, January-May 1955-56

	Jan.-May 1956	Jan.-May 1955	Percentage Increase or Decrease
	(1,000 Lbs.)		%
IMPORTS:			
Tuna, fresh or frozen	58,900	65,158	- 10
Tuna, canned	13,824	11,765	+ 18
Bonita, canned	6,801	7,703	- 12
Salmon, fresh or frozen	1,566	4,070	- 62
Salmon, canned	10,480	1,038	+910
Sardines, canned	8,458	8,638	- 2
Shrimp	26,123	16,645	+ 57
Lobsters, fresh or frozen	20,332	20,420	1/
Crab meat, canned	1,979	1,273	+ 55
Groundfish fillets	41,940	30,026	+ 40
Groundfish blocks and slabs	13,503	23,206	- 42
Swordfish	7,759	8,011	- 5
EXPORTS:			
Salmon, canned	662	4,307	- 85
Sardines, not in oil, canned	20,676	19,105	+ 8
Fish oils, inedible	45,995	43,624	+ 5

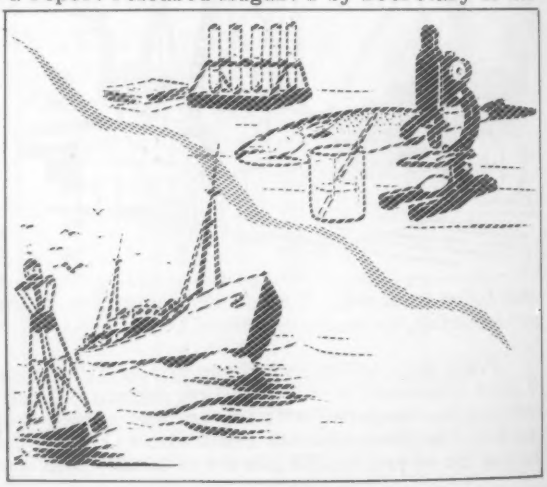
1/ A decrease of less than one-half percent.

Principal changes shown in exports were increases in canned sardines and fish oil and a decline in canned salmon.

Fish meal imports during January-May 1956 of 51,167 tons were 7 percent higher than the 47,967 tons for the same period a year earlier.

United States Governmental Expenditures in Fiscal 1956 for Fishery Research

United States and state agencies and international fisheries commissions spent $13,975,000 in the fiscal year ending June 30, 1956, on research and services for commercial fisheries, according to a report released August 2 by Secretary of the Interior Fred A. Seaton.



Categories considered in the report include expenditures for biological research, hatchery and river basin studies, exploratory fishing and gear research, technological studies (refrigeration, utilization of products, etc.), collection and publication of statistics and market news data, economic studies, market development and education activities, and various other types of research and services.

Of this total expenditure, $9,292,000 was from regular Fish and Wildlife Service appropriations ($2,811,000 of which was from funds made available by the Saltonstall-Kennedy Act), $4,015,000 was supplied by States, and $668,000 by International Commissions.

Of all the funds spent on fishery research, the report shows that $4,733,000 was spent in salmon research and services; tuna activities got $1,504,000 of which

$1,386,000 was spent on the Pacific fishery; oysters got $1,068,000 of which $984,000 was spent on Atlantic and Gulf of Mexico problems; for sardines $1,184,000 was spent with $957,000 going to the Pacific; while $613,000 was spent on the Atlantic and Gulf of Mexico shrimp fishery. The menhaden and halibut fisheries each got $245,000. Research and services for all varieties of fresh-water fish amounted to $917,000. The remainder of the funds were distributed among numerous other fish including rockfish, flounders, ocean perch, mackerel, mullet, striped bass, scallops, clams, crabs, and northern lobsters.

More than half of the $4,015,000 supplied by States went to three varieties of fish: salmon research and development work getting $983,000, eastern and southern oyster projects receiving $706,000, and $638,000 for work on the Pacific sardine.

Funds of the international fisheries commissions were distributed in the interests of three fisheries: salmon, $282,000; tuna, $198,000; halibut, $188,000.

The annual catch of fish varies from year to year but approximates 4.5 pounds. The value of the catch also varies but it approximates $350 million a year.

The report puts shrimp in first position in value of the catch at the boat, third at the level of the processor and primary wholesaler, and second at the retailer level. Tuna ranks first for the processor and primary wholesaler, first for the retailer, and second for the fisherman and boat owner. Salmon is second for the processor and primary wholesaler, third for the retailer, and third for the fisherman and boat owner.

As far as volume is concerned, menhaden is far ahead with a catch of about 1.7 billion pounds annually, or about 38 percent of the total catch. Menhaden, which is used for meal and oil, ranks in sixth, seventh, and ninth positions in value, respectively, to the processor, fisherman and boat owner, and retailer.

Alaska is first among the states and territories in number of fishermen with 14,000 out of a total of 153,000. California heads the list of fishing craft in operation with more than 10,000 out of a total of about 87,000 craft. California, Massachusetts, and New Jersey are rated one, two, three in volume of catch; California, Massachusetts, and Florida are one, two, three in the value of the catch.

The report, Major Commercial Fisheries with Data, on Research Expenditures, Fishery Leaflet 435, may be obtained from the Division of Information, Fish and Wildlife Service, Washington 25, D. C.

U. S. Production of Fishery Byproducts, 1955

FISH MEAL AND SCRAP: Production of fish meal and scrap in the United States and Alaska during 1955 amounted to 264 thousand tons. Compared with the production reported for 1954, this was a 3-percent increase. The largest production recorded for a single month during 1955 was in July when nearly 53 thousand tons were processed (table 1).

Table 1 - U. S. Production of Marine-Animal Scrap and Meal, 1955 and 1954

Product	1955		1954	
	Quantity	Value	Quantity	Value
	1,000 Short Tons	$1,000	1,000 Short Tons	$1,000
Meal and Dried Scrap:				
Alewife	0.3	43.2	-	-
Anchovy	0.2	29.9	0.2	25.4
Crab, blue	8.1	445.2	10.1	598.1
Crab, dungeness	.2	9.2	0.2	10.3
Fur seal	0.3	19.6	0.3	33.5
Groundfish ("white fish") incl. ocean perch	6.1	815.5	7.2	934.6
Herring	7.7	1,163.5	7.0	928.9
Menhaden	190.6	25,449.3	183.1	23,783.4
Sardine (Pilchard)	7.0	968.9	6.5	842.6
Salmon	0.7	88.6	1.2	137.5
Shrimp	0.5	34.3	0.9	50.3
Tuna and Mackerel	23.4	3,120.3	21.5	2,845.2
Unclassified	19.2	2,542.2	18.7	2,558.0
Total	264.3	34,729.7	256.9	32,747.8

MARINE ANIMAL OIL: The total yield of fish oils during 1955 amounted to 24.8 million gallons, compared with 21.5 million gallons for the preceding year (table 2).

Table 2 - U. S. Production of Fish Oils, 1955 and 1954

Product	1955		1954	
	Quantity	Value	Quantity	Value
	1,000 Gals.	$1,000	1,000 Gals.	$1,000
Body Oil:				
Anchovy	16.1	9.3	9.3	5.0
Fur seal	40.5	26.4	40.2	19.9
Herring	1,091.0	668.7	760.9	434.3
Menhaden	21,115.2	12,131.8	18,641.4	9,755.3
Sardine (Pilchard)	897.7	521.6	755.9	420.5
Salmon	145.6	91.7	183.0	141.9
Tuna and Mackerel	544.9	264.2	584.9	243.5
Unclassified	710.9	502.5	652.4	393.1
Total	24,561.9	14,216.2	14,216.2	11,413.5
Liver and Viscera Oil:				
Cod	148.9	129.6	161.5	133.8
Shark	47.2	176.7	26.3	298.4
Miscellaneous	22.7	282.4	48.9	959.7
Total	218.8	588.7	236.7	1,391.9
Grand Total	24,780.7	14,804.9	21,864.7	12,805.4

CONDENSED FISH SOLUBLES AND HOMOGENIZED CONDENSED FISH: The production of condensed-fish solubles during 1955 (157.1 million pounds) was 9 percent blow 1954. The homogenized-condensed fish production during 1955 totaled 41.2 million pounds, compared with 47.1 million pounds the preceding year (table 3).

Table 3 - U. S. Production of Fish Solubles and Homogenized-Condensed Fish, 1955 and 1954

Product and State	1955		1954	
	Quantity	Value	Quantity	Value
	1 Million Pounds	$1 Million	1 Million Pounds	$1 Million
Fish Solubles:				
Maine, Massachusetts, Rhode Island	14.1	0.5	9.9	0.5
New York, New Jersey, Delaware	62.1	2.1	64.7	3.1
Virginia	3.1	0.1	20.7	1.1
North Carolina, Florida	6.9	0.3	7.3	0.4
Mississippi	10.2	0.4	5.5	0.3
Louisiana, Texas	15.4	0.6	13.1	0.6
California, Oregon	45.3	2.0	51.0	2.3
Total	157.0	6.0	172.2	8.3
Homogenized-Condensed Fish:				
Massachusetts, Rhode Island	41.2	1.5	57.9	2.3
Grand Total	198.2	7.5	230.1	10.6

Wholesale Prices, July 1956

The usual mid-season lull in landings and production was responsible for the higher prices in July for most edible fresh and frozen fishery products. The July 1956 over-all wholesale index (114.6 percent of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) rose 4.5 percent over the previous month and 10.7 percent over that for July 1955.

Trawlers unloading at the Boston Fish Pier.

Although weather conditions were ideal in all fishing areas, fish were scarce, particularly in the North Atlantic. Lighter landings for fresh haddock at Boston and the evenly-distributed landings of halibut on the Pacific Coast caused the prices for these products to go up considerably from June to July 1956, and these products were priced substantially higher than in July 1955. Salmon prices dropped slightly from June to July 1956 because of more liberal landings on the Pacific Coast. Among the fresh-water fish, July 1956 whitefish prices were lower because supplies were fairly plentiful, but lake trout and yellow pike prices were higher because catches were light. The drawn, dressed, or whole finfish subgroup in July 1956 was 15.2 percent higher than the previous month and 22.6 percent higher than in the same month a year earlier.

There were only slight changes in the prices for processed fresh fish and shellfish between June and July. Lower prices for fresh shrimp at New York were more than offset by substantially higher prices for fresh haddock fillets at Boston. However, both of these products in July 1956 were priced considerably higher than in July a year ago. Shrimp landings in the South Atlantic were moderate to liberal.

The July 1956 index for the fresh processed fish and shellfish subgroup was only 0.7 percent higher than the previous month, but 19.1 percent above the same month in 1955.

Higher prices for frozen shrimp at Chicago, because of excellent demand, accounted for the 5.0-percent increase in the subindex for processed frozen fish and shellfish from June to July 1956. Higher prices for nearly all items in the subgroup were responsible for the 10.3-percent increase in this subindex from July 1955 to July 1956. Only frozen ocean perch fillet prices dropped from June to July because of liberal stocks.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1956 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			July 1956	June 1956	July 1956	June 1956	May 1956	July 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					114.6	109.7	111.7	103.5
Fresh & Frozen Fishery Products:					125.9	117.5	120.6	106.3
Drawn, Dressed, or Whole Finfish:					122.5	106.3	113.3	99.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.06	92.2	56.3	70.9	57.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	2/ .34	122.2	107.3	123.8	90.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.64	.64	142.7	144.4	140.5	130.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.48	.53	119.0	131.4	153.7	81.8
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.65	.69	131.4	139.5	148.6	131.4
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.60	.58	122.9	117.8	104.5	93.2
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.54	.34	126.7	78.6	68.0	161.8
Processed, Fresh (Fish & Shellfish):					128.6	127.7	126.1	108.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.33	.25	112.3	85.1	91.9	78.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.80	.82	126.4	129.3	124.8	105.9
Oysters, shucked, standards	Norfolk	gal.	5.50	5.50	136.1	136.1	136.1	117.5
Processed, Frozen (Fish & Shellfish):					117.7	112.1	115.2	106.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	2/ .39	102.1	102.1	103.4	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.28	.28	86.3	86.3	91.0	83.2
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.28	109.8	110.8	114.8	106.7
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.82	.75	126.6	116.1	118.1	108.8
Canned Fishery Products:					98.7	98.7	99.0	99.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	2/ 22.65	2/ 22.65	120.0	120.0	120.0	109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.60	10.60	76.4	76.4	76.4	92.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.50	7.50	87.5	87.5	87.5	88.1
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	cs.	8.20	8.20	87.3	87.3	89.9	71.3

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ Revised.

Note: The canned salmon price shown in the index for January, February, March, April, May, and June (Commercial Fisheries Review: March 1956, p. 25; April 1956, p. 27; May 1956, p. 34; June 1956, p. 51; and July 1956, p. 55; respectively) was incorrect and should have been $22.65 a case. However, the canned index for each of these months was not affected and was correct as shown.

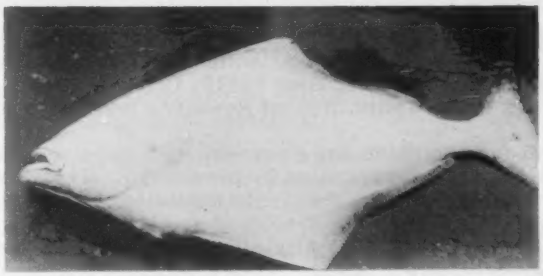
Canned fishery products prices remained unchanged from June to July 1956 and were only 0.5 percent lower than in July 1955. In July 1956 the canned tuna pack was greater than for the same period a year earlier, and the same was true for the canned Maine sardine and canned salmon packs. However, the good demand for nearly all canned fishery products accounted for the steadiness in prices. Prices in July 1956 as compared with the same month in 1955 were substantially higher for canned salmon and Maine sardines but were almost offset by the lower prices for canned tuna and California sardines.

FOREIGN

International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

AREAS 3A AND 3B CLOSED AUGUST 24: The closure of the first fishing season in Pacific halibut Areas 3A and 3B was set for August 24 (6 a.m. P.S.T.), according to an announcement of August 6 by the International Pacific Halibut Commission. The Comission estimated that by August 24 the catch limit of 28 million pounds for Area 3A would be reached. There is no catch quota for Area 3B, but that area closes on the same date as Area 3A.



Halibut.

The official opening date for all halibut fishing in the Pacific regulatory areas this year was May 12 (6 a.m. P.S.T.), but fishing did not commence until May 20 because of a voluntary delay agreed upon by all United States and Canadian halibut fishermen.

Areas 3A and 3B this year were open to fishing for 104 days--the longest season for those areas since 1947 when the season lasted for 109 days. For the last few years the trend has been towards a shorter season. However, this year fishing in those areas lasted longer because (1) fishing started 8 days later than the opening date established by the Commission, (2) most vessels voluntarily agreed to remain idle for 7 days after each trip, (3) there were a few days of inclement weather on the fishing grounds, and (4) fish were scarce in certain popular fishing sections. In view of the fishermen-agreed 8-day delay of the opening date, actual fishing in Areas 3A and 3B was possible for only 96 days. In 1955, Areas 3A and 3B were open to fishing for 81 days as compared with 58 days in 1954, 52 days (shortest on record) in 1953, 60 days in 1952, 56 days in 1951, 66 days in 1950, 73 days in 1949, and 72 days in 1948.

This year, according to the regulations, the second fishing season of 7 days in Areas 2 and 1B was scheduled to begin at 6 a.m. P.S.T. September 9 (16 days after the end of the first season in Area 3A, which was announced as August 24). The second fishing season was scheduled to end at 6 a.m. September 16, unless a later termination date was announced.

The second fishing season of 9 days in Areas 3A and 3B was scheduled to begin at the same time as that for Area 2, but was scheduled to end at 6 a.m. September 18 unless a later termination date was announced.

A third fishing season of 23 days in Area 3B only was scheduled to begin at 6 a.m., September 30 (12 days after the end of the second fishing season for that

area) and end at 6 a.m. October 23, 35 days after the end of the second season. In the event the Commission announces a date later than September 18 for the end of the second halibut fishing season in Areas 3A and 3B, the opening and closing dates of the third season in Area 3B shall be changed accordingly.

Area 1A, which has been open continuously to halibut fishing since May 12 is scheduled to close at 6 a.m. on the same day that the third halibut fishing season in Area 3B shall end.

After the termination of the last of the fishing seasons in each area, that area shall be closed to halibut fishing until it is reopened in 1957.

Area 1A includes the waters south of Heceta Head, Ore.; Area 1B, the waters between Heceta Head and Willapa Bay, Wash.; Area 2, the waters between Willapa Bay and Cape Spencer, Alaska; Area 3A, the waters between Cape Spencer and the Shumagin Islands off the coast of Alaska; and, Area 3B, the waters west of Shumagin Islands and in Bering Sea.

NORTHWEST ATLANTIC FISHERIES COMMISSION

REPORT ON ANNUAL MEETING: The Annual Meeting of the International Commission for the Northwest Atlantic Fisheries convened at Commission headquarters in Halifax, Nova Scotia, June 11-15, 1956. The Annual Meeting was preceded by meetings of the Committee on Research and Statistics on June 8-9.

All ten countries were represented at the meeting. West Germany and the U.S.S.R. were represented by observers. The Commission would probably hold its next meeting in Lisbon on May 20, 1957.

Substantive questions of the Commission's recommendations for mesh-size regulation in Subareas III, IV, and V were of principal concern. Of the recommendations made by the Commission at its meeting in Ottawa in June 1955, only that for Subarea V, which involved minor amendments to the existing regulation, had received complete acceptance by the governments in the panel involved. The recommendations for $4\frac{1}{2}$-inch mesh in Subarea IV and 4-inch mesh in Subarea III had been objected to by the French Government. The French Government had no objection to the mesh size in itself but found it impossible to accept the provision which restricted the use of chafing gear. This objection stemmed from the fact that French trawlers operating in the Northwest Atlantic fished at great depths, and the French found it necessary to use double and sometimes triple cod ends in order to prevent the gear from bursting when brought to the surface. This question was discussed thoroughly during the Commission's meeting and the French Commissioners agreed that an investigation should be undertaken immediately by French scientists to find ways of strengthening the gear so that double and triple cod ends would not be necessary. The United States, United Kingdom, and Canada all agreed to cooperate with and assist the French Government to the greatest extent possible in this study. After some further discussion of the problem, the French Commissioners agreed to vote for an amendment to the regulations for Subareas III and IV, which would place the restrictions on chafing gear in abeyance until July 1, 1957. At that time they would go into effect automatically unless the French Government notified the United States of its continued objection. It was the hope of the Commission that this amended regulation could be brought into effect by January 1, 1957. If so, on that date the use of $4\frac{1}{2}$-inch mesh in Subarea IV and 4-inch mesh in Subarea III would be required, but there would be no restriction on the use of chafing gear. It was the further hope of the Commission that

by the first of July 1957 the French Government would have solved its problem and be prepared at that time to accept the limitations on chafing gear. This proposed

Delegates, advisers, observers, and staff members of the Sixth Annual Meeting of the International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., June 1956.

amendment to the regulations for Subareas III and IV was adopted by the Commission for transmittal to the governments for their final approval.

The question of the ten-percent annual exemption which the United States Commissioners proposed to the Commission met with considerable resistance, particularly from the United Kingdom because of the damaging precedent which that Government felt the exemption would establish in the North Sea and the Northeast Atlantic and from Canada because that Government felt that the administrative problems connected with such an exemption were insuperable. After much discussion, it was agreed that the ten-percent exemption might be adopted as an experiment in Subarea V only for a period of two years. If, at the end of one year, there was evidence that a ten-percent exemption permitted large numbers of small haddock to be taken, the percentage might be reduced. In any event, the results of the experiment would be reviewed by the Commission at the end of two years to determine whether or not it was successful and the ten-percent annual exemption might be adopted permanently.

The Standing Committee on Research and Statistics reported considerable progress was being made in tagging, in the standardization of methods of measuring fish, and in the coordination and research on cod, ocean perch (redfish), halibut, and haddock.

Iceland asked for a panel membership in Panel 1. The application was approved by Panel 1 and accepted by the Commission.

An application by United Kingdom for panel membership in Subarea 4 was, after some discussion, withdrawn by that delegation.

The question of the Italian membership in Panels 1, 2, 3, and 4 was considered. The Italian delegates stated that they had proposed to the Italian Government that it inform the Commission before the end of June 1956 if any changes were wished. Further action was deferred.

The Committee on Research and Statistics opened its session this year on June 8 by continuing study of the Commission's research needs which it had begun at Biarritz, France, in March. Its principal point of reference was the list of recommendations which the working parties of experts had made regarding gaps in knowledge that must be filled in order to carry out the Commission's functions. To fill these gaps requires a comprehensive research program throughout the Convention

Area. Such a program is beyond the capacity of any one member of the Commission; it must be carried out by all members closely collaborating in designing the work, coordinating the operations, and integrating the interpretations. Such collaboration is the principal function of this Committee and is the purpose of interim meetings such as that held at Biarritz.

Taking a long view of the research needs of the Commission, it will be necessary for all of the members to increase their support of research. The amount of increase which each country should plan must depend on its present expenditures for fishery research in the area and on the volume of fish which it harvests. During this year's session, the Committee outlined research programs dealing with cod, haddock, ocean perch, and halibut, and with several subjects that apply to all species, namely population dynamics, causes of natural mortality, and techniques of fishery research. These programs, which are appended to the report on the Biarritz meeting, are laid down as a guide for future planning, not as a prescription for full, immediate action. The Committee urges the Commission members to foster the orderly increase of support for fishery research in their respective countries as rapidly as feasible, beginning immediately by taking the essential first step of making provision for adequately sampling their fisheries at sea and also ashore.

Panel 1 met once. The Commission noted the Panel's statement that all countries should carry out samplings of their commercial catches and report these to the Secretariat for compilation, and that hydrographic data should be reported to the Secretariat in table form; further that the Panel considered the cooperation with ICES as to hydrographic reporting satisfactory, and agreed that the generous offer of the International Ice Patrol to furnish ICNAF with data on their sections in Subarea 1 should be gratefully accepted. The Commission noted with satisfaction the progress in research work in the area, especially as to cod and halibut.

Panel 2 met twice. The Commission noted that Portugal had initiated samplings of its cod catches in Subarea 2, that Canada hoped to do so in the future, and that this country had continued its explorations for ocean perch in the Hamilton Bank Area.

Panel 3 met once. The Commission noted with gratification that the Spanish researches on haddock had been developed considerably and that Portugal had initiated extensive samplings from its cod fishery in the Subarea. The Panel discussed the proposed mesh regulations, especially the French reluctance to accept the method of mesh measuring and the clauses as to chafing gear. Otherwise France had accepted the regulations, which in their entirety had been accepted by all other member countries. The question of the clauses on chafing gear were referred to the new ad hoc committee.

Panel 4 met once. The Commission noted that the United Kingdom had withdrawn its application for a panel membership in view of the lack of substantial exploitation. It was further noted that Portugal had commenced samplings of its commercial cod catches, and that joint researches by Canada and the United States regarding haddock were carried out. For France the same problems as to the trawl regulations were found in Subarea 4 as in 3; the problems were considered by the Panel and also in the joint panels' meeting.

Panels 3 and 4 met jointly to consider the problems of mesh proposals and of chafing gear for Subareas 3 and 4.

Panel 5 met twice. The Commission noted that the United States was facing minor difficulties in continuing the small mesh study boat program, but that the panel had agreed that this important study had to be continued.

The United States proposal to amend the present exemption of the haddock regulation to allow a 10 percent per annum exemption was considered. It was agreed that a series of questions had to be answered before a decision could be taken. These questions were formed and referred to the Committee on Research and Statistics. It was agreed that part of these questions, especially as to enforcement, were hardly within the province of the standing committees.

Therefore the Panel proposed to the Plenary to establish another committee for such problems, and the Plenary appointed an ad hoc committee to deal with any such problems.

GREAT LAKES FISHERIES COMMISSION

FIRST MEETING HELD: The Great Lakes Fisheries Commission met at Sault St. Marie, Ontario, July 30 and heard reports from United States and Canadian researchers working on the sea lamprey problem, states the July Official News Bulletin of the Michigan Department of Conservation.

Ann Arbor, Michigan, has been named the official headquarters for the Commission, an international six-member board recently set up to help fisheries research and to guide sea lamprey control on the Great Lakes.

Lampreys have devastated certain fish populations in the Great Lakes. Electrical weirs are blocking many rivers emptying into the Great Lakes to prevent lampreys from spawning. Also, certain chemicals have been found to kill young lampreys living in upriver mud and gravel banks.

At present, 97 weirs are in operation on Lakes Superior, Michigan, and Huron; 55 more are scheduled for construction on Lake Michigan streams and 10-26 on Lake Superior streams this year. Others will be built on other lakes in the next few years so that barriers will block all rivers on all the Great Lakes by the end of 1960.

The Commission was to hold its next meeting in Ann Arbor in mid-August and called its statutory annual meeting for late November 1956.

INTERNATIONAL LAW COMMISSION

INTERNATIONAL CONFERENCE SUGGESTED TO SETTLE BREADTH OF TERRITORIAL WATERS: The International Law Commission after five years of discussions voted in June 1956 to make no decision on the breadth of territorial waters within a limit of 12 miles, reports The Fishing News (June 15, 1956), a British fishery periodical. The Commission suggested that the subject should be settled by an international conference.

The Commission, who began its work in 1951, is preparing a draft report on The Regime of the High Seas for approval by the next session (November 1956) of the United Nations General Assembly.

The draft recognizes that "International practice is not uniform as regards the delimitation of the territorial sea;" and that, though many states have fixed a breadth greater than three miles, "many states do not recognize such a breadth when that of their own territorial sea is less."

Britain, the United States, and the Soviet Union were amongst the majority of nine who, believing that only an international conference could settle the matter, considered it advisable to go no farther at this stage than to lay down that: "The Commission considers that international law does not permit an extension of the territorial waters beyond 12 miles."

Before the vote was taken, Britain's representative stated that Britain had always championed the three-mile limit and declared that any extension above this figure would upset the balance of the Commission's work and some countries would have seriously to reconsider their position.

He pointed out that the Commission had already granted coastal states the right to take unilateral action to protect fisheries outside their territorial waters and, if further concessions were granted regarding the territorial sea, some states might well start claiming the continental shelf as well.

The Commission has still to complete its examination of the question of straight base lines where a coast is deeply indented.

For some weeks the International Law Commission, which consists of 15 legal experts from different countries, has been meeting in Geneva and discussing the codifying and developing of international law. The Commission approved the following text submitted by Greece's representative:

"(i) The Commission recognizes that international practice is not uniform as regards the delimitation of the territorial sea.

"(ii) The Commission considers that international law does not permit an extension of the territorial sea beyond 12 miles.

"(iii) The Commission, without taking any decision as to the breadth of the territorial sea within that limit, notes, on the one hand, that many states have fixed a breadth greater than three miles and, on the other hand, that many states do not recognize such a breadth when that of their own territorial sea is less.

"(iv) The Commission considers that the breadth of the territorial sea should be fixed by an international conference."

During the discussion of draft articles on fisheries at Geneva, an amended article was proposed by Judge Edmonds (U.S.) which said that where the yield of fish was dependent on the conservation program being carried on by the state or states whose nationals were substantially fishing such stocks, states not so fishing or which had not done so within a reasonable period of time, excepting the coastal state adjacent to the waters in which this stock was found, should abstain from fishing such stock.

Judge Edmonds described his proposal as a progressive step in the development of international law, reports a Geneva correspondent. Judge Edmonds was supported by Dr. P. Nervo (Mexico) who spoke of "the justified exclusion of third parties by abstention."

Sir Gerald Fitzmaurice (U.K.) pointed out that the principle might violate the doctrine of nondiscrimination enshrined in the Commission's draft. Mr. Francois (Netherlands), the special rapporteur, strongly approved the principle, which he said could hardly be regarded as a victimization of newcomers to fishing grounds. The Commission agreed with the chairman's view that the question should be taken up when the Commission dealt with the whole matter of exclusive rights in certain areas of the high seas.

FOOD AND AGRICULTURE ORGANIZATION

WORLD MARINE RESOURCES SURVEY MAY SUPPLY KEY TO FUTURE: Marine biologists of many nations employed by the Food and Agriculture Organization are engaged on complex work of collecting, sorting, analyzing, codifying, and recording by decimal classificaion, facts and information about the oceans, seas, rivers, and inland waters of the world.

These men are engaged on a task which will take many years to complete--a survey of the living aquatic resources of the world. It is a task which relates to the activities of the Member Governments of the 72 nations of FAO, and of marine biologists, and of fishery scientists studying the world's fisheries, as well as fishermen themselves. Ultimately, this resources survey, of which FAO acts as a clearing house and stimulator, not an originator, may determine the future welfare of fisheries throughout the world.

"Fisheries are still in a primitive state as compared with, say, farming," said Dr. G.L.Kesteven, Chief of the Biology Branch, Fisheries Division, FAO, who is in charge of the Organization's work on the survey. "The ultimate aim in fisheries is to conduct the industry with the same efficiency and certainty which now exists in agriculture, although, of course, we can never hope to 'farm,' as it were, all the oceans and seas. But we need to practice fish husbandry to the fullest extent within the limits possible. We need to manage, control, and breed fish as a farmer manages, controls, and breeds animals so that we can cultivate fish, whether at sea or in fresh water, for the benefit of mankind, that is to say, breed them for our purpose, pasture them as we do animals, and harvest them for food or commercial purposes as we do sheep or cattle.

"At the present time we are a great distance from such a goal," he continued, "although Governments have made the first tentative steps in that direction through the introduction of fishery controls such as closed seasons for catching certain fish and regulations concerning the size of nets to be used, and have, as in the case of whales, restricted the quantities that may be caught in one season."

The problem of management, control, and development of fisheries, is complicated by a number of factors. First, no individual or nation has property rights over the oceans and seas or the life in them. Even the extent of ownership of territorial waters is in dispute. Second, about 75 percent of the earth's surface is covered by water and knowledge of the life and resources of this vast area is limited. Third, the knowledge that does exist of well-known and exploited sea fisheries is inadequate for rational management on a national or international scale.

"According to statistical information available, only about 10 percent of animal protein food consumed by man comes from the waters of the world," said Dr. Kesteven. "Our present knowledge of resources indicates that we could gather much more food from this source and also use much greater quantities of sea products for commercial purposes. For example, Dr. Woodward of the United Kingdom, estimates that there are 10 million tons of brown seaweed available around Scotland and one million tons could be harvested each year to produce 70,000 to 110,000 tons of carbohydrate. He has also estimated that there are 60 million tons of such weed growing on the coasts of Norway, France, the British Isles, Canada, and the Falkland Islands. This is only one example of aquatic flora which could be used by man and, as always when one talks about marine life, the figures run into astronomical dimensions."

Fish and aquatic mammals are at the end of the food chain in the sea, but there are intermediate stages in this chain which might be of commercial value. Zooplankton is an example. This minute growth is a basic food for many creatures in the sea. Whales, for example, consume millions of tons of it. Man can use zooplankton and in Asian countries great quantities are used in the manufacture of pastes and other fishery products. Attempts have been made by governments of western countries to use zooplankton industrially but with little success so far.

"I mention these in passing to indicate that any survey of marine resources is concerned with much more than fish," explained Dr. Kesteven, "although, naturally, mankind is more directly interested in the food he can get for immediate consumption, that is to say, fish. We have gathered much more knowledge about the available commercial fish but before we can reach a point of conducting fish husbandry we need to know a tremendous lot more. What we do know has led to some conservation measures being taken as, for instance, in the North Sea where it has been recognized that unrestrained overfishing might lead to gross depletion of stocks. Fishery biologists believe that, through international agreement at government level and through other control and conservation activities, the yield of fisheries can be maintained at a determined level but we need full knowledge of all the factors involved before we can attain such results.

"Another practical result from a world survey of marine resources would be the discovery of the nature and extent of stocks in relatively unexploited grounds, of new grounds, and, perhaps, the commercial uses for trash fish or species which are not now considered to be of any value."

The discovery in recent times of new resources of fish and crustacea indicates that the oceans contain much unknown wealth. It is estimated, for example, that only 10 percent of known plaice grounds are being fished, and it is quite possible that there are also many unknown flat fish grounds. In South African waters a huge pilchard fishing industry has grown up within the past 10 years or so. In the case of crustacea, in the past 50 years new resources have been found and exploited off the east coast of America, the east coast of Australia, the Mexican Gulf, and even in the Mediterranean. Again, only this year an FAO master fisherman discovered a new shrimp ground, 140 miles in extent, ranging along the west coast of India.

"These are only a few instances of finding and exploiting new resources," said Dr. Kesteven. "They tend to support the theory held by some that there are no deserts in the sea and perhaps a survey of aquatic resources may ultimately prove this to be well-founded. However that may be, the steadily increasing catch of fish in the world is a pointer to the potential possibilities. At present, the total catch of fish, crustaceans, and molluscs amounts to about 27 million metric tons, according to the FAO Yearbook of Fishery Statistics. This is about 5 million metric tons more than was caught in, say, 1938, and marine biologists believe that the total might well be raised to some 50 million metric tons annually in the course of the next 20 years or so.

"But in order to increase production, we must have comprehensive knowledge of the resources, and the object of the survey is to provide us with that knowledge.

"I should stress," he continued, "that FAO's part in this survey is a clearing-house of information. We do not carry out research and surveys ourselves, except through the agency of technical assistance projects, but we are attempting to collate all available information and to disseminate that information to governments and international fishery agencies and to other interested fishery organizations, firms, and persons."

In connection with this work, FAO is collaborating with the Bibliographia Oceanographica, with Member Governments of FAO, and with international fishery organizations.

"We attempt to read, appraise, and extract all information in current literature relative to the survey of aquatic resources," explained Dr. Kesteven. "In doing so we read some 2,500 books and contributions in periodicals a year from which we extract information which we record by a punched card system. In a year we probably deal with some 3 or 4 thousand cards. The editors of Bibliographia Oceanographica are engaged on a similar work and produce a great number of reference cards, which they exchange with us.

"We are also engaged on compiling an Oceanic Thesaurus which we hope to make into a compendium of information concerning the species of fish caught in various countries and regions, the economic value of stocks and species, and the productivity of marine and inland waters in all parts of the world."

One of the byproducts of FAO's work will be a world atlas of fishing maps. These maps will contain in simple and easy-to-see form all the immediately important information relative to world fisheries. The atlas will be issued next year. Meanwhile, the information which Dr. Kesteven and his assistants are continually extracting is being brought to the attention of governments and fishery organizations.

"It is important to realise," said Dr. Kesteven in conclusion, "that the work we are doing on this survey of marine resources is only one contribution to the development of world fisheries. There are a great number of other activities involved, such as technical developments in fishing, exploitation of known stocks, and increasing the productivity of the fisheries in underdeveloped countries through mechanization and the introduction of modern catching techniques. There are also a multitude of financial, marketing, social and economic considerations, all of which can, and often do, affect any national or international development of fisheries. Our principal task is basic, that of gaining knowledge and understanding of the marine resources, and when we have that knowledge it will have a practical effect on all policy, plans, and work concerned with the development of world fisheries."

WHALING

WHALE AND SPERM OIL OUTPUT UP IN 1956: World production of whale and sperm whale oils in 1956 is forecast at 425,000 and 105,000 short tons, respectively, as compared with 418,000 and 93,000 tons last year (table 1). This increase was due to high yields and came in spite of the cut in the Antarctic catch quota from 15,500 blue whale units to 15,000 per season. Although there was a slight increase in the Antarctic production, most of the increased output came in other areas.

Table 1 - Whale and Sperm Oil Estimated World Production, by Major Producing Country, Annual 1954-56

Country	Whale Oil			Sperm Oil		
	1/ 1956	2/ 1955	1954	1/ 1956	2/ 1955	1954
	(1,000 Short Tons)					
Norway	136	138	188	25	26	7
United Kingdom	76	77	90	12	11	9
Japan	83	73	58	27	23	15
Netherlands	16	11	17	3	1	1
Panama	27	27	-	3	3/	10
Union of South Africa	20	21	31	9	6	4
Soviet Union	29	33	32	15	15	15
Australia	19	18	19	-	-	-
Argentina	8	9	10	3/	3/	3/
Chile	3	3	2	4/	4/	3/
Portugal 4/	-	-	-	4	4	4
Others	8	8	7	3	3	7
World Total	425	418	454	105	93	75

1/ Forecast.
2/ Preliminary.
3/ Less than 500 short tons.
4/ Production of Azores & Madeira Islands.

Antarctic whaling, including that done by 3 South Georgia coastal stations, is expected to account for nearly 90 percent of the world output of baleen whale oil this year. The same area, however, is expected to turn out only about three-fifths of the world supply of sperm oil. The major part of the increase in 1956 sperm oil production is expected to come from Japanese operations, both in the North Pacific and off the coast of Japan.

Although the number of expeditions engaged in Antarctic pelagic whaling in the 1955/56 season was the same as in the previous year (table 2), each expedition

added one or two catcher boats thereby increasing its production potential. Thus the season lasted only 58 days, a considerably shorter period than the 72 and 76 days of the two previous seasons. The total catch amounted to 14,875 blue-whale units, which is 125 less than the 15,000 units maxiumum stipulated by international agreement.

The International Association of Whaling Companies, following a meeting in June, reportedly announced that British, Norwegian, Japanese, and Dutch whaling

Table 2 - Whale and Sperm Oil Antarctic Pelagic Production, 1954/55 and 1955/56

Country	Whale Oil		Sperm Oil		Total	
	1/ 1955/56	2/ 1954/55	1/ 1955/56	2/ 1954/55	1/ 1955/56	2/ 1955/56
	(Short Tons)					
Norway	122,227	125,258	24,316	25,833	146,543	151,091
United Kingdom	64,294	64,403	12,140	10,420	76,434	74,823
Union of South Africa	15,042	15,460	5,349	3,169	20,391	18,629
Netherlands	15,901	10,888	3,411	1,195	19,312	12,083
Japan	63,254	58,799	13,058	9,686	76,312	68,485
Panama	27,329	27,193	2,714	409	30,043	27,602
Soviet Union	26,723	30,249	1,972	1,871	28,695	32,120
Total	334,770	332,250	62,960	52,583	397,740	384,833

1/ Provisional. 2/ Revised. 3/ Does not include production of 3 South Georgia shore stations. In 1955/56 this production, according to the provisional data, was 31,440 tons of whale oil and 765 tons of sperm oil, as compared with 33,005 and 770 tons, respectively, in 1954/55.

companies had agreed to limit the number of whale-catching vessels for the 1956/57 season to a total of 210, excluding those to be used by the Soviet Union. The agreement stipulates the maximum number of catchers to be used by the companies or groups of companies, but allows the groups to apportion the number of whale catchers among their different expeditions. The total number of catchers used by all expeditions during the 1955/56 season was 257.

The pelagic catch quota for the 1956/57 season has not yet been announced.

UNITED KINGDOM-SOVIET RUSSIA FISHERIES AGREEMENT

The British and Soviet Governments on May 25, 1956, reached an agreement on Barents Sea fishing limits. The main feature of the agreement, which runs for five years from the time of ratification, is that the 12-mile limit is dispensed with, and the Soviet Union has accepted, in practice if not in principal for the future, the expediency of a 3-mile limit. A separate exchange of letters accompanying the agreement states that nothing in it prejudices the claims or views of either government about the legal extent of territorial waters. According to press reports and a United States Embassy dispatch dated May 28, the five-year treaty falls short of perfection, but it does make important concessions to the British distant-water trawlermen. The following is a summary of the agreement published in the London Times of May 26:

"The agreement means in practice that British vessels will be excluded from the western end of the coast of Russia for a distance of about 100 miles, and that they will no longer be able to fish at the western side of the entrance to the White Sea. Both these stretches were included under the previous agreement of 1930, which expired in July 1955.

"The fishing grounds open to British vessels have been extended along the northern shore of Russia for roughly another 100 miles eastward from their previous limit. British vessels will also be able to fish up to a three-mile limit round the island of Kolguev, north-east of the Kanin Peninsula. The limits are defined as running along the coast of the Kola Peninsula between the meridians 36 degrees and 37 degrees, 50 minutes E., along the mainland to the east of the point at Cape

Kanin between 43 degrees 17 minutes and 51 degrees E., and also along the coast of Kolguev to a distance of three sea miles from low water mark. Under the old agreement the area covered was between 32 degrees E. and 48 degrees E. and included part of the entrance to the White Sea to latitude 68 degrees 10 minutes N.

Australia

TUNA GROUND FOUND OFF SOUTH AUSTRALIA: A major tuna fishing ground exists in South Australian waters off Port Lincoln. It extends at least from Flinders Island to the Neptune Islands and is capable of supporting a tuna industry of reasonable size.

This has been reported to South Australia's Premier by one of two California tuna fishermen brought out by the South Australian Government for trial tuna fishing.

The California fisherman said the tuna were chunkier than those caught off California, giving a better yield with less waste. He said the Government should persevere with investigations into pilchard possibilities also.

Under a Government guarantee the two San Diego, Calif., fishermen came to South Australia for three months' testing of the waters for tuna and to introduce pole fishing to the Australian fishermen. They arrived in early February and operated aboard the M/V Tacoma at first. On March 19 one of the fishermen transferred to the Fairtuna which had only recently been purchased by H. S. Wilson of Port Lincoln.

To date, though southern bluefin made up the bulk of the catch of 160 metric tons, yellowtail, trevally, and several striped tuna were also captured. This is the first recording of the capture of striped tuna in South Australia.

The two California fishermen were scheduled to leave Port Lincoln April 18 on their way home, reports the (Australian) Fisheries Newsletter of May 1956.

Note: Also see Commercial Fisheries Review, July 1956, p. 71.

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SALT ABSORPTION BY WHOLE SPINY LOBSTERS IN COOKING: It has been the practive in Tasmania to prepare spiny lobsters (Jasus lalandi) for the home market by drowning them in fresh water and cooking them whole in boiling salt water. It was believed that salt was taken up by the edible meat, thereby improving its palatability.

A survey of Tasmanian processing establishments by an officer of the C.S.I.R.O. Division of Food Preservation and Transport led to the following observations:

Salt concentrations in cooking waters in various factories ranged from 3.5 percent (sea water) to 23 percent by weight.

Many processors assessed the degree of saltiness of the cooked edible meat merely by tasting the leg meat.

No accurate data were available on the extent of salt absorption by the edible meat in different parts of the spiny lobster.

There was no evidence of excessive saltiness in the taste of tail meat from spiny lobster which had been cooked in water having a high salt content.

Australian spiny lobsters being weighed before packing.

Recently some processors, in an attempt to introduce salt into the meat, have drowned the spiny lobster in warm concentrated brine and cooked them in steam. Here again there was no information on the effectiveness of the procedure.

Experiments carried out at the C.S.I.R.O. Tasmanian Regional Laboratory at Hobart to obtain quantitative data on the absorption of salt by the meat of spiny lobster cooked in salt brines indicate different conclusions.

The concentrations of salt found in the four selected portions of meat, raw and after various cooking treatments, are shown in the table, each figure being the average value for three shellfish in each group. Deviations of individual values from the mean were very small. The tail meat absorbed very little salt even in the concentrated solutions; meat more than $\frac{3}{8}$-inch below the surface did not absorb salt until the brine strength was increased beyond 10 percent. There was a slight loss of natural salt by leaching on cooking in fresh water, but only from the surface layer. Leg meat absorbed small amounts of salt in brines of low strength and about 1.5 percent in the most concentrated solution.

Although marine spiny lobster contain appreciable concentrations of sodium chloride in the edible meat, it is generally considered in the trade that the palatability of the cooked meat is improved by the addition of salt to bring its concentration up to about 1.5 percent. To reach such a level in the tail meat of shellfish similar to those used in these experiments would require an additional 0.8 percent.

The assumption by the trade that cooking whole spiny lobster in boiling salt brines brings about such an increase is not supported by the experimental evidence. Even when they were cooked in very strong salt brines, the increase was only about 0.3 percent. In weaker brines similar to those used by most of the Tasmanian processors there was very little change in salt content of the tail meat during cooking. Cooking in fresh water reduced the salt content only slightly.

It is also clear that the saltiness of leg meat cannot be used as a satisfactory index for assessing the concentration of salt in tail meat. The leg meat in the raw material used had an initial salt content almost twice that of the tail meat and in addition it showed an appreciable increase in salt concentration even in weak brines.

It has been assumed that the practice of drowning the spiny lobster in strong salt brines prior to cooking in steam appreciably increases the salt content of the tail meat. The above results suggest that this would be most unlikely during the short periods of immersion used for drowning.

When the whole spiny lobster is immersed in strong salt brine before or during cooking, small quantities of brine may be entrapped within the shell. It has been argued that there may be an additional uptake of salt from these areas during frozen storage. The diffusion of salt into the edible meat during frozen storage is not

Concentration of Salt in Spiny Lobster Meat					
	Raw	Cooked in			
		Fresh Water	Salt		
	%		5%	10%	20%
	(Percent)				
Tail meat (inner)	0.5	0.5	0.5	0.5	0.7
Tail meat (2nd layer)	0.7	0.7	0.7	0.7	1.0
Tail meat (surface)	1.0	0.9	1.0	1.2	1.3
Leg meat	1.3	1.2	1.5	1.8	2.8

likely to be of great importance according to an article in the May 1956 (Australian) Fisheries Newsletter.

In the raw meat of the three shellfish used in the experiment, there was a well-defined gradient in salt concentration from the center to the surface of the tail and a larger concentration in the leg muscles. The existance of this gradient has since been confirmed in other cases. It is unlikely, therefore, that it was introduced during handling, for example, by contamination with sea water.

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WHALE MEAT SHIPMENTS TO UNITED STATES FOR PET FOOD: An Australian whaling company reportedly has now made definite arrangements to sell its whale meat production from two shore-based whaling stations to a United States firm manufacturing pet foods. The whale meat is to be shipped to the United States in a refrigerated cargo vessel owned and operated by the purchaser of the meat, declares a United States Foreign Agricultural Service report from Canberra.

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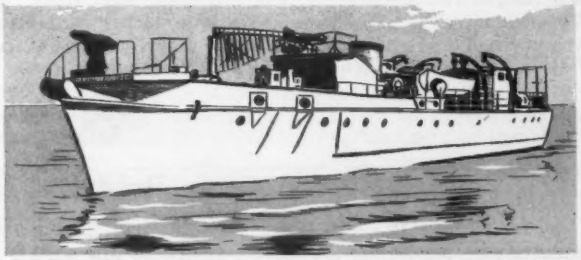
SHORE-BASED WHALING SEASON, 1956: The Australian shore-based whaling season for 1956 started at Albany in Western Australia on June 8 and on the eastern coast at Tangalooma, Queensland, on June 11. Quotas for the mainland stations will be the same as last year, but an additional quota of 150 whales has been provided for a new whaling station nearing completion on Norfolk Island. The base quota for this station has been determined at 120 whales per annum, but approval has been given for a quota of 150 whales in this, the first year.



An Australian whale chaser. Note folded mast to get under low bridges and on foredeck the tractor which serves as a winch for playing whales.

As a result of this increase in total Australian quotas (1,990 whales), it appears likely that oil production from whaling during the 1956 season will approximately be 8 percent higher than last year, and will again exceed 4.8 million gallons (U.S.). The quotas for Western Australian stations, which were reduced last year, have not been revised although 1955 results showed an improvement on the 1954 catch in relation to size.

The Norfolk Island station nearing completion was expected to begin operations some time during August 1956, when the catcher now operating at Byron Bay will be transferred there. The new station is a subsidiary of the same meat company operating Byron Bay station. Government officials believe in spite of some whale-meat exports for pet food to the United States that production of whale-meat meal may be maintained at the level of previous years by greater concentration of solubles. Apparently the prospective dollar earnings provided an added incentive for the approval of whale-meat exports, declares a United States Foreign Agricultural Service report from Canberra dated June 26.

Bahama Islands

FISHERIES TRENDS, 1955: Exports of Fishery Products, 1952-55: The export of spiny lobsters (crawfish) by the Bahama Islands continued to be encouraging in 1955. The export of fresh fish was less than one-third of 1954 exports and far less than the amount exported in 1952.

Prices in the local market are extremely high, however, and fishermen have no difficulty in selling their catches locally.

Value of Bahama Islands Exports of Fishery Products and Byproducts, 1952-55

Product	1955		1954		1953		1952	
	£	US$	£	US$	£	US$	£	US$
Spiny lobsters	160,647	449,812	163,743	458,480	156,920	439,376	99,649	279,017
Fresh fish	1,399	3,917	4,387	12,284	3,992	11,178	10,656	29,837
Shells	21,792	61,018	20,524	57,467	33,014	92,439	23,052	64,546
Sponges	-	-	1,021	2,859	1,198	3,354	664	1,859
Total	183,838	514,747	189,675	531,090	195,124	546,347	134,021	375,259

A possibility exists for the establishment of a tuna cannery in Bimini. During the tuna season, which is short, however, thousands of pounds of tuna are caught by game fishermen and very little of the catch is consumed.

Sponge Fishery: In 1938 the sponge beds of the Colony were devastated by a marine disease and, with the exception of a few months in 1946, were closed until January 1956. The beds remained open until March 31, and the quantity gathered exceeded expectations, and the quality was excellent. The total value of sponge sold at the sponge market, open from April 16 to May 11, was £27,237 (US$76,264). The harvest consisted of wool, grass, hardhead, and reef sponges. Velvet sponge, 20 years ago marketed in large quantities, appears to have become extinct, according to the United States Consulate at Nassau (dispatch of July 5, 1956).

Note: Values converted on the basis of £1 equal $2.80

Belgium

MARINE OIL MARKET: Belgium's fish oil trade is insignificant. A fair quantity of whale oil is used. There is one small plant which produces about 400 tons of fish oil a year. This oil is not of a particularly good quality since it is made from offal. The offal is a byproduct from the curing of herring. About 1½

Belgium's Crude and Refined Marine Oil Imports, 1955

Type and Country or Origin	Quantity	Type and Country or Origin	Quantity
	(Metric Tons)		(Metric Tons)
Crude:		Other:	
France	23	France	4
Norway	8,157	Iceland	5
Netherlands	1,625	Norway	409
Portugal	28	Netherlands	7
United Kingdom	15	United Kingdom	66
West Germany	2	Sweden	3
Japan	63	West Germany	4
United States	598	Japan	79
Falkland Island	508	United States	1
Sea	740	Total Other	578
Errors and omissions	2		
Total Crude	11,761		

years ago two of the margarine manufacturers in Belguim imported some American menhaden oil which was refined and hydrogenated. They both claim that the oil reverted and the flavor of the margarine after a few days was unsatisfactory. The margarine manufacturers, themselves, thought that the independent refiners in Belgium had not had sufficient experience in refining fish oil, and the product prepared by them was inferior to that made either in Holland or Germany

There does not seem to be any separate statistics on fish oil alone. These are incorporated in the general category of marine oils. Imports of marine oils, both crude and refined, by source during the year 1955 are shown in the table.

The survey was able to ascertain that out of a total of 71,700 tons of all fats used in the manufacture of margarine in 1955, approximately 10,000 tons was whale oil. No fish oil so far as we could ascertain was used.

Small quantities of lower-grade domestic fish oil are used for industrial purposes, such as leather dressing, etc., and the balance is usually exported to the Netherlands under the BENELUX agreement.

This is one of eight reports on a survey undertaken by the U. S. Fish and Wildlife Service of markets for United States-produced oils with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 66, 70, 71, 87, 90, 96, & 99 of this issue.

British Honduras

STATUS OF THE FISHERIES, 1955: No improvement took place in 1955 in the British Honduras fishing industry. In fact, the value of marine products exports decreased by some 35 percent below that of 1954. The decrease was attributed almost entirely to a decline in the sales of whole spiny lobsters to the United States.

No statistical or other information is available as to total production of the fishing industry. A large number of fishermen provide fresh fish to Belize and the other

Table 1 - British Honduras Exports of Fishery Products

Product	1955		1954		1953		1952	
	BH$	US$	BH$	US$	BH$	US$	BH$	US$
Fish:								
Fresh, frozen or live	4,782	3,347	17,434	12,204	16,204	11,343	9,069	6,348
Salted	7,318	5,123	17,385	12,170	5,206	3,644	9,336	6,535
Lobsters, spiny:								
Whole	16,610	11,627	31,231	21,862	3,019	3,113	10,539	7,377
Tails	74,166	51,916	75,057	52,540	75,288	52,702	79,943	55,960
Other (conchs & shrimp)	3,862	2,703	2,421	1,695	2,737	1,695	443	310
Totals	106,738	74,716	143,528	100,471	102,454	71,718	109,330	76,530

coastal towns, generally selling their daily catches direct to the ultimate purchasers or, more infrequently, to retailers who in turn sell at the local fish markets.

The legal entanglements involving the United States firm holding the exclusive franchise for lobster shipments to the United States continued to be before the local courts and were not settled until the spring of 1956. These legal questions continued to be the main reason why lobster fishing was not carried on aggressively. With the settlement of this legal difficulty, it is foreseen that lobster fishing will soon be tackled more forcefully and may result in increased production and exports.

Late in 1955 another firm began exploring the possibilities for shipping lobsters to the Mexican, Guatemalan and other Central American markets. The survey

Table 2 - British Honduras Fishery Products Exports to United States

Product	1955		1954		1953		1952	
	BH$	US$	BH$	US$	BH$	US$	BH$	US$
Spiny lobster, whole ..	8,413	5,889	24,594	17,216	84	59	5,493	3,845
" " tails ...	73,530	51,471	73,926	51,748	74,666	52,266	79,112	55,378
Fish, fresh or frozen	-	-	14,836	10,385	13,790	9,653	5,627	3,939
Total	81,943	57,360	113,356	79,349	88,540	61,978	90,232	63,162

revealed attractive possibilities, and work was begun in organizing the business and installing freezing and associated equipment, states a United States consular dispatch (June 29) from Belize.

Note: Values converted to US$ on the basis of BH$1 equals US$0.70.

Canada

ANTIBIOTICS FOR PRESERVING FRESH FISH: Canadian experiments in the use of antibiotics in the preservation of fresh fish were described by Dr. H.L.A. Tarr, of the Fisheries Research Board of Canada Technological Station, Vancouver, B. C., in a paper presented at the International Meeting of Fish Processing Technologists at Rotterdam, Netherlands, June 25-29.

In his paper Dr. Tarr stated that aureomycin was more effective than terramycin or tetracycline in retarding the bacterial spoilage of fish. In the course of experiments with salmon caught off Vancouver Island, flaked ice containing 1 p.p.m. aureomycin was found to be superior to ordinary ice. Convenient methods have been found to add aureomycin to flaked ice as it is being made, and to distribute the antibiotic uniformly in block ice. Studies on the penetration of aureomycin into fish meat have revealed that only a small amount gets through the skin or belly flaps, and residual antibiotic is removed when the fish is cooked, reports the June 1956 Trade News of the Canadian Department of Fisheries.

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FISH CONSUMPTION INCREASING: The Canadian consumption of fish is slowly rising, partly due to the efforts of the industry and the Department of Fisheries, and also to improved transportation and cold-storage facilities, Canada's Minister of Fisheries told the House of Commons in Ottawa in his annual review. There was a substantial increase in the number of cold-storage units in 1955. The Minister stated that the industry was in good condition, according to a news item which appeared in The Fishing News (June 15, 1956), a British fishery periodical.

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FISHERIES TRENDS, FIRST QUARTER 1956: Despite bad weather Canadian fishermen in the first quarter of 1956 landed the biggest catch on record for that period. Total landings were 459 million pounds valued at C$10.9 million, compared to 236 million pounds valued at C$7.0 million for the same period in 1955, points out a June 29 United States Embassy dispatch from Ottawa.

The herring catch on the Pacific Coast was principally responsible for the good showing, with 315 million pounds landed in the three-month period as compared to

117 million pounds a year earlier. On the Atlantic Coast there were heavier than usual catches of haddock and sardines. In terms of ex-vessel value, haddock landings were worth C$1.9 million and sardines C$0.3 million, an increase over last year of C$0.5 million and C$0.2 million, respectively. The lobster catch on the east coast was valued at C$1.5 million as compared to last year's C$1.2 million, although the catch was appreciably smaller this year.

Filleting operation at a large fish plant in St. John's, Newfoundland.

The high level of the first quarter showed signs of dropping off during succeeding months. April landings were 61 million pounds or 27 percent below April 1955 and were valued (C$3.7 million) at 6 percent less. An exception to the general picture was the very good Pacific Coast salmon catch in April of 535,000 pounds valued at C$164,000 as compared to April 1955's 288,000 pounds valued at C$85,000.

Frozen fish stocks at the end of March 1956 were 30.7 million pounds and at the end of April had risen to 34 million pounds. Total freezings of fish in Canada were 50.2 million pounds for the first quarter of 1956 and an additional 12.0 million pounds in April.

Exports of fishery products remained steady at C$19.5 million for January-February 1956 as compared to C$19.0 million in the same period of 1955. The United States increased its purchases and continued to be the major buyer. Sales to Europe declined in the first two months from those of a year previous while those to the Caribbean area increased.

* * * * *

MINIMUM MESH-SIZE REGULATIONS FOR ATLANTIC TRAWL NETS: Regulations prescribing minimum mesh sizes in Canadian Atlantic trawl nets will go into effect on January 1, 1957. The regulations apply to nets being used to fish cod and haddock. They do not apply to nets being used to fish ocean perch exclusively.

Table 1 - Minimum Mesh Sizes for Otter-Trawl Netting Used in Subarea 4

Kind of Twine	Minimum Mesh, Internal Measure Used and Wet	Size of Twine	Recommended New 1/ Netting Mesh Size (Between Knot Centers)
Manila-double	$4\frac{1}{2}$ in.	60 yds. & larger twine	$5\frac{5}{8}$ in.
		61-80 yds.	$5\frac{1}{2}$ in.
		81 yds. & smaller twine	$5\frac{3}{8}$ in.
Manila-single		60 yds. & larger twine	$5\frac{1}{8}$ in.
		61 yds. & smaller twine	5 in.
Cotton-single & double	$4\frac{1}{4}$ in.	All sizes	$4\frac{1}{4}$ in.
Nylon-single & double	4 in.	All sizes	$4\frac{1}{4}$ in.

1/ These sizes refer to individual pieces of netting. In a bale of netting the pieces usually vary slightly in mesh size. To make sure that all pieces in the bale are at least equal to the recommended mesh size, the netting is usually ordered with a mesh size $\frac{1}{16}$ to $\frac{1}{8}$ of an inch larger than the equivalent mesh size for new dry netting.

The regulation prescribes a minimum mesh size for all parts of the trawl. The parts mainly affected are the cod end, lengthening piece, and the aft part of the belly. Other parts of the trawl usually have larger meshes than those prescribed as a minimum, the June 1956 Trade News of the Canadian Department of Fisheries announces.

Mesh regulation is already in effect for Subarea 5, Georges Bank and adjacent waters. The regions affected by the new regulation are Subarea 4 and Subarea 3. Subarea 4 includes the Bay of Fundy, Nova Scotian waters and the Gulf of St. Lawrence. Subarea 3 includes the Newfoundland fishing banks.

Table 2 - Minimum Mesh Sizes for Otter-Trawl Netting Used in Subarea 3

Kind of Twine	Minimum Mesh, Internal Measure Used and Wet	Size of Twine	Recommended New 1/ Netting Mesh Size (Between Knot Centers)
Manila - double	4 in.	60 yds. & larger twine	$5\frac{1}{8}$ in.
		61-80 yards	5 in.
		81 yds. & smaller twine	$4\frac{7}{8}$ in.
Cotton - single and double	$3\frac{3}{4}$ in.	All sizes	$3\frac{3}{4}$ in.
Nylon - single and double	$3\frac{5}{8}$ in.	All sizes	$3\frac{3}{4}$ in.

1/ See footnote in table 1.

The minimum mesh size prescribed for Subarea 4 is the same as that for Subarea 5. For Subarea 4, Manila netting used in otter trawls must have a mesh size larger than $4\frac{1}{2}$ inches, internal measure, measured wet after use. For Subarea 3, the minimum mesh size for Manila netting is 4 inches, measured in a like manner. Other materials shrink and stretch to a different degree than Manila. They may also allow the escape of different sizes of fish than Manila through the same size mesh opening. The necessary equivalents for other materials are thus included in the preceding tables. Also included are the recommended mesh sizes of new netting which should meet the minimum mesh size specified. Internal mesh size is measured with a gauge which is forced into the mesh under 10 to 15 pounds pressure.

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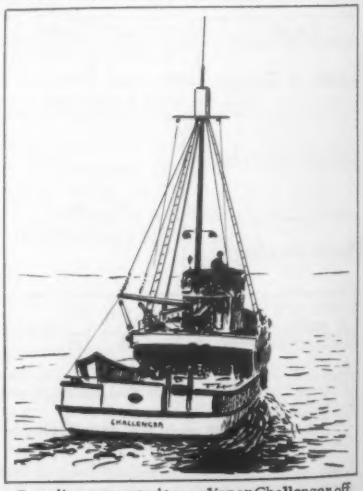
DISTRIBUTION OF SALMON IN NORTH PACIFIC OFFSHORE WATERS STUDIED: A survey now being undertaken by Canadian, United States, and Japanese vessels will, it is hoped, prove to be a major step towards determining the distribution and migration routes of salmon and other fish in the North Pacific Ocean.

The crews and the scientific observers accompanying them are making scheduled fishing tests at stations scattered over an immense area, under the auspices of the International North Pacific Fisheries Commission. It is the largest ocean sampling of fish stocks ever undertaken. The scientists hope eventually to find out if overlapping of races between Asiatic and North American stocks occurs, and if so at what point the two populations merge.

The Fisheries Research Board of Canada has chartered two Canadian fishing vessels which, under direction from the Board's Biological Station at Departure Bay near Nanaimo, B.C., are making a series of cruises over nearly 500,000 square miles of ocean. The western boundary of the area to be covered by these two boats is approximately 1,000 miles offshore from British Columbia.

The converted seiner Key West 2 completed her first Pacific Ocean run at the end of May and



Canadian converted tuna clipper Challenger off on its first survey cruise in the North Pacific.

started her second after refrigeration facilities had been installed. Key West 2 is also equipped with an electronic device which will enable her captain to "see" schools of fish under water at any point within 180 degrees forward of the boat for short distances.

The second Canadian vessel, the Challenger, a former tuna clipper, left Nanaimo on May 30 on a run which will take her to the farthest limits of the area alloted to Canada for survey.

The ocean stations at which tests are to be made are set out on a grilled map of the North Pacific. United States and Japanese vessels will take their fishing samples north and west of the Canadian area.

The ships are manned by professional fishing crews, and there are scientific observers on each one, points out the June 1956 Trade News of the Canadian Department of Fisheries.

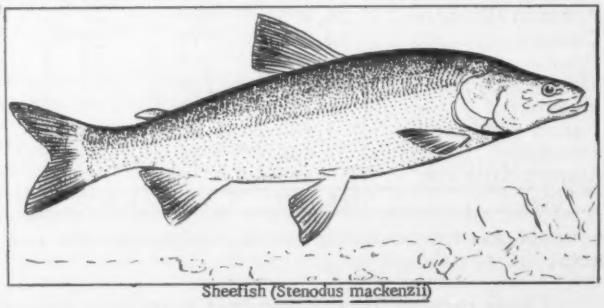
The Canadian vessels will fish with specially made gill nets of varying mesh sizes. Already a number of salmon have been taken in fishing at certain ocean stations. The first catches were mainly of sockeye salmon, with a few pink and some other varieties. Other fish species are not to be overlooked; the vessels are equipped with tuna-trolling gear for use if schools of that fish are encountered.

In the early stages of the survey all specimens are being retained and sent to the Biological Station at Nanaimo for examination. During the later stages a proportion of the fish caught will be tagged and released.

Last year, the Fisheries Research Board had boats follow juvenile salmon from the mouths of streams into Hecate Strait and beyond, through Dixon Entrance in northern British Columbia coastal waters. This year's program calls for the tracing of the movements of fish in ocean waters far from the coast. Tags placed on young salmon last year will be sought at all stages of the investigation. The tags are made of colored plastic tubing and are known as the "spaghetti type." Fishermen have been asked to forward any that are found to any fisheries officer or to the Board's station at Nanaimo.

* * * * *

SHEEFISH OR INCONNU: Early voyagers gave the name "inconnu" to a fish found in the Northwest and Yukon Territories, where it is of importance as food for humans and for sled dogs. When the voyagers first traveled those regions they caught some of the fish, the first of the kind they had ever seen. "Poissons inconnus"--unknown fish, they said, and since then the word "Inconnu" has passed into usage as the name of the fish, although often it is shortened to "connie" or "coney." In Alaska it is called "sheefish."



Sheefish (Stenodus mackenzii)

The commonly accepted scientific name is Stenodus mackenzii. The "mackenzii" is derived from the fact that in North America the inconnu is found mainly in the Mackenzie River Basin, although as stated it is also to be found in the Yukon Territory and Alaska. A similar species occurs in Siberia.

Although the inconnus of the Mackenzie Basin all belong to the same species, they appear to be divided into two forms. One of the two is a landlocked or freshwater form found in Great Slave Lake; the other is a migratory form found in the Lower Mackenzie River.

Inconnus found in the Yukon are said to be smaller, on the average, than those taken in the Mackenzie district. The fish is light in exterior coloring, with the dorsal fin dusky at the tip and the caudal fin shading to dark at its edge. The lower jaw is longer than the upper and is usually somewhat hooked. There are bristle-like teeth in the upper jaw and weaker ones below. The meat is white but rather soft and oily.

Eskimos of the Mackenzie delta sometimes catch inconnus with barbless hooks, fishing through the ice; sometimes by means of a fishing spoon or bait, or perhaps a hook baited with a thin piece of bone. Commercial fishermen use gill nets to catch the fish, points out the Canadian Department of Fisheries Trade News of June 1956.

There was no fishing for inconnu on a commercial scale until 1945, but since that time fishermen operating on Great Slave Lake have taken them in nets set primarily for whitefish and lake trout. Drying and smoking are the methods used when preparing the fish for future local use.

Cuba

CANNED SARDINE MARKET: Cuban sardine imports in 1955 totaled 185,259 cases (7.4 million pounds) valued at US$1,369,842, f.o.b. port of origin, reports a July 17 dispatch from the United States Embassy in Habana. Data on sardine imports are not available on a year-by-year basis, but they were compiled for 1955. The consensus in trade circles is that 1955 was a normal year and indicative of the current market.

Table 1 - Cuba's Canned Sardine Imports by Country of Origin, 1955

Country	Quantity		Value
	Actual Cases	1,000 Lbs.	US$ 1,000
United States	75,765	3,068	513
French Morocco	42,080	1,852	337
Portugal	23,193	864	221
Spanish Morocco	16,995	698	136
Canada	19,071	571	95
Spain	2,749	115	34
Holland	2,350	124	17
Belgium	750	21	6
Japan	1,600	36	5
Germany	600	21	5
United Kingdom	106	2	1
Total	185,259	7,372	1,370

Cuba imports substantial quantities of United States sardines. Trade circles stress the possibility of increasing these imports if prices are particularly advantageous. Such increases would not be at the expense of other suppliers, since there is an established demand for the types of sardines imported from other countries. The potential larger market would be dependent upon reduced prices which would encourage sardine consumption in substitution for low-cost meat and other fish products.

Trade circles also report that there is a substantial unfilled demand for a can of sardines that can retail for about 10 cents. Such a can must be convenient to open with a key. The packing medium may be tomato sauce or oil, although the best promise would be for an oil-flavored product to resemble olive oil. The number of sardines in a can is not considered important.

There is no production of canned sardines in Cuba.

Consumption follows the pattern which has been established through the years. An increase has occurred when prices of sardines have been especially favorable

Table 2 - Cuba's Canned Sardine Imports by Type of Pack and Country of Origin

Type of Pack	Country of Origin	Quantity		Value
		Actual Cases	1,000 Lbs.	US$1,000
Tomato sauce	U. S. A.	75,761	3,068	513
	Japan	1,600	36	5
	Total	77,361	3,104	518
Tomato with olive oil	Portugal	7,740	279	67
	Spanish Morocco	6,798	279	54
	Spain	413	16	4
	Total	14,951	574	125
Tomato with soya oil	Canada	6,381	185	28
Tomato with peanut oil	French Morocco	15,149	667	121
	Holland	2,350	124	17
	Germany	200	11	2
	Total	17,699	802	140
Olive oil	French Morocco	4,208	185	34
	Portugal	12,838	478	130
	Spanish Morocco	10,197	419	82
	Spain	2,336	98	30
	Total	29,579	1,180	276
Peanut oil	French Morocco	22,723	1,000	182
	Portugal	2,615	106	24
	Germany	400	10	3
	Total	25,738	1,116	209
Soya oil	U. S. A.	2	1/	1/
	Canada	12,690	386	67
	Total	12,692	386	67
Mustard	U. S. A.	2	1/	1/
Unidentified	United Kingdom	106	3	1
	Belgium	750	22	6
	Total	856	25	7
Grand total		185,259	7,372	1,370

1/ Less than US$1,000 and 1,000 pounds.

as compared with prices of other low-coast fish and meat products, and during periods of scarcity of these products. Consumption is at its peak during the sugar season and other periods of high employment, when workers buy sardines for their meals at work. It appears there would be little receptivity to new uses of sardines since they are consumed without further processing.

The percentage of sardines consumed by the high, medium and low income groups is estimated at 5, 15, and 80 percent, respectively.

Retail market prices for 3¼-ounce canned sardines packed in tomato sauce (United States or Canadian) range from 10-15 cents a can; 3¼-ounce sardines in olive or other oil from 12-20 cents, with a popular price of 2 for 25 cents for lower-priced brands; 15-ounce cans in tomato sauce range from 28-40 cents with 30 cents generally applicable to California sardines and 38 cents to other imports. Other types of sardines range in price from 30-45 cents, depending on the marketability of the particular product.

Denmark

FISHERY PRODUCTS EXPORTS TO UNITED STATES: Danish fishery products exports to the United States have climbed from 12.6 million kroner (US$1.8 million) in 1953 to 13.8 million kroner (US$2.0 million) in 1954 to a high of 16.8 million kroner (US$2.4 million) in 1955. Fish exports to the United States consisted mainly of frozen brook trout and smaller amounts of canned mackerel, fresh cod fillets, and fresh plaice fillets in that order, according to a United States Embassy dispatch (July 3) from Copenhagen.

Feedstuffs exports to the United States, consisting largely of fish meal, have dropped sharply from 9.6 million kroner (US$1.4 million) in 1954 to 3.1 million kroner (US$0.4 million).

Note: Values converted to US$ on the basis of 6.907 kroner equals US$1.

* * * * *

MARINE OIL MARKET: Denmark's trade in fats and oils is quite large in proportion to its population of about 4.5 million people. While fish oil is not one of the major oils used in Denmark, its importance is increasing each year (table 1).

Table 1 - Denmark's Production of Fish Oils, 1949-55

Year	Metric Tons
1955	19,000
1954	11,000
1953	9,770
1952	6,701
1951	5,948
1950	2,517
1949	2,391

There is considerable feeling in Denmark that fish oil will become more important because it is anticipated that the production of whale oil by European whaling units will probably decrease due to the greatly increased operating costs. Practically all of the fish oil produced in Denmark is either herring oil or tobis (sand eel) oil. The tobis is an eel-like fish which is caught in the North Sea and yields an oil very similar to herring oil. The smaller fish reduction plants mix it with the herring oil without indicating that the resulting product is a mixture. The iodine number of the herring oil produced in Denmark runs from 135 to 150, while tobis oil runs from 145 to 160.

Table 2 - Denmark's Fish Oil Exports by Country of Destination, 1955

Country of Destination	Metric Tons
West Germany	5,201.0
Norway	2,215.1
Sweden	4,800.6
Holland	112.5
Spain	57.0
Czechoslovakia	68.4
Others	14.4
Total	12,469.0

The survey included the most modern and up-to-date fish reduction plant in Denmark at Esbjerg. This is a cooperative operation and was founded in 1948 and is at present handling about 1,500 tons of fish a day. Its members own 160 boats fishing for reduction purposes exclusively. A great deal of the fish oil produced in Denmark is exported (table 2).

Imports of fish oil are practically negligible--163 metric tons in 1955, mostly from Norway (109.2 tons) and some from Sweden (51.7 tons). Imports of whale oil were 16,103 tons of which 15,054 tons came from Norway.

In the course of the survey, the two plants in Denmark that refine and produce edible grades of fish oils for use in Denmark were visited. One is at Aarhus and the other at Copenhagen. In both cases they indicated that they found that United States menhaden oil was not suitable for their purpose. It does not produce the type of edible product that is required. All of the fish oil used in Denmark (with the exception of very minor amounts) is for edible purposes in combination with whale

oil, for the manufacture of margarine. It was indicated that should Denmark ever find it necessary or advantageous to import fish oil that the following order was their judgment of the quality of various fish oils produced in other countries, starting with the best:

(1) Canadian pilchard oil.
(2) Norwegian or Iceland herring oil.
(3) California pilchard oil.
(4) American menhaden oil.
(5) Moroccan and Portuguese oils.
(6) Angola fish oil.

Neither of these refiners is polymerizing fish oil for the production of edible liquid fish oil. It was indicated that since the German Government took action forbidding the use of polymerized fish oil, for edible purposes, practically no plants are producing polymerized oil at present and the use of edible fish oil for fish canning has declined considerably. Its place has been taken by edible vegetable liquid oils such as cottonseed oil and/or soybean oil. Both of these plants indicated that they were able to produce a good quality of edible hydrogenated fish oil suitable for the manufacture of margarine and which did not revert to the fishy flavor for a considerable period of time. They claim that they have a special refining method by which the oil is neutralized as quickly as possible after production, being stored in that condition rather than as the crude and untreated material. Both of these plants have distillation units and make distilled fatty acids from the refining residues, however, they do not fractionally distill the fatty acids. These fatty acids are sold to the industrial trade.

Table 3 - Denmark's Fish-Liver Oil Imports by Country of Origin, 1955

Country of Destination	Metric Tons
West Germany	279.4
United Kingdom	37.2
Norway	1,182.8
Iceland	671.6
Greenland	49.2
Portugal	10.4
Others	4.5
Total	2,235.1

Practically no fish oil, as such, is used in Denmark for industrial purposes. For purposes such as leather treating, etc. seal oil is imported principally from Norway (1,032 tons out of a total of 1,042 tons) and some sperm oil is also imported for the production of higher alcohols. Considerable quantities of fish-liver oil are also imported and used for fortifying the margarine produced in Denmark (table 3).

It is understood that there is also an export of hydrogenated fish oil and whale oil. It was impossible to secure accurate statistics since the figures are included in the category of "hardened animal oils" (table 4).

Table 4 - Denmark's Exports of Hardened Animal Oils 1/ by Country of Destination, 1955

Country of Destination	Metric Tons	Country of Destination	Metric Tons
West Germany	29.3	Egypt	501.7
East Germany	115.3	Tunisia	70.3
Sweden	5.4	French Morocco	259.2
Iceland	20.0	British Egyptian Sudan	16.3
Finland	8.8	Iraq	20.3
Italy	147.9	Iran	10.2
Switzerland	30.0	Cyprus	56.8
Greece	169.5	Syria	27.0
Haiti	38.4	Lebanon	19.9
British West Indies	287.8	India	12.1
Peru	532.0	Others	140.0
Eduador	34.6	Total	2,559.3

(Continued in next column

1/ It should be understood that probably nearly all of this consists of fish and/or whale oil since there is very little actual tallow, grease, or other hydrogenated animal fat exported from Denmark.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 70, 71, 87, 90, 96, and 99 of this issue.

Ecuador

NEW FISHERIES REGULATIONS: A decree has been promulgated providing that exporters of fish shall deliver to the Central Bank their full foreign exchange earnings or that portion of their earnings which the Monetary Board may fix. The Fisheries Law had previously required that only US$100 per ton need be converted at the Central Bank's official exchange rate; the balance could be converted through the broker's free market or retained by exporters. Reportedly some 2,000 tons of tuna were exported during 1955 with a total value of approximately US$600,000, together with approximately 1,000 tons of shrimp valued at around US$1,600,000. Only US$300,000 were converted at the Central Bank, according to a July 13 report from the United States Embassy at Quito.

The Ministry of Economy has also issued a regulation requiring that export taxes be collected on all fish shipped abroad. Reportedly fishing companies had been obtaining exemption from export taxes on the ground that they were shipping an industrial product. (Industrial products pay no export duties.) According to the National Fisheries Director, fish that are merely frozen but not canned do not come within the industrial category. The exemption had allegedly been causing a loss of 1,000,000 sucres a year to the National Treasury.

The new decree on foreign exchange amends Article 36 of the basic Fishing and Maritime Hunting Law (Ley de Pesca y Caceria Maritima), Decree No. 003, published in Registro Oficial No. 747 of February 23, 1951, as follows (in informal English translation): "... exporters of fish, crustaceans, etc. will turn over to the Central Bank the net product of their exports by their declared value, duly verified, or according to the minimum prices fixed by the Monetary Board in relation to prevailing quotations in the international markets, in accordance with the power granted the Board by Article 1 of the Fishing Law... ."

An article appearing in the Guayaquil newspaper El Universo of July 8, 1956, states that the promulgation of the new decree confirms reports which the paper has been printing recently to the effect that companies exporting products of the sea have been gravely prejudicing the Ecuadoran Treasury by evading various provisions of the Fishing Law, that the Minister of Economy was aware of this situation and was studying the necessary means to put a stop to such practices, and that one of these means is the present Emergency Decree. The paper goes on to say that on May 31, 1956, the Minister of Economy communicated to the President the reasons for promulgating the decree. The Minister stated that in compliance with the then existing Fishing Law, exporters were required to turn over to the Central Bank only US$100 for each ton of exports. The Minister said that unquestionably this constituted a privilege for such exporters amounting to an official subsidy. He stated further that such exporters enjoyed better facilities than were granted exporters of other basic products who sometimes find themselves in an unfavorable situation. He then quoted figures to show that exporters of fishing products were being required to turn over to the Central Bank only about 12.5 percent of the foreign exchange value of their exports while retaining some 87.5 percent for themselves. The Minister compared this with the situation of banana exporters who are, he stated, permitted to retain only a few centavos on each stem exported, to be exchanged at the free market rate as partial compensation for their present difficulties. The Minister cited the foregoing as justification for the Emergency Decree, stating that the present deficit in the international balance of payments does not permit waiting until Congress convenes. The article concluded that the National Council of Economy has unanimously approved the promulgation of the Emergency Decree for the same reasons.

In an article published in El Universo on July 10, 1956, it was stated that the National Council of Economy has approved the new decree and that the Monetary Board would meet in Guayaquil starting July 10 to discuss the fixing of the minimum

export prices and consequently the amounts which must be turned over to the Central Bank by exporters of fish and seafood.

In El Universo of July 11, 1956, it was announced that the Junta Monetaria resolved at its session of July 10 that the same "appraisement control" regarding the exportation of shrimp would be maintained until August 10, 1956, and that the question of the percentage of foreign exchange to be turned over to the Central Bank after that date would continue to be studied at the Board's current meetings in Guayaquil.

In connection with taxes on fishery products exports, the Ministry of Economy issued Resolution No. 155, published in Registro Oficial No. 1164 of July 4, 1956, instructing the Fisheries Department of the Ministry to notify persons and companies who apply for exemption from export taxes on sea products which are not "industrialized," as provided by Article 37 of the Fishing Law, that they are required to pay such taxes. An article in El Universo of July 12, 1956, stated that the resolution was issued to implement the measures taken by the Ministry to curtail the "sinecures and privileges" enjoyed by seafood exporters to the detriment of the Ecuadoran Treasury. It is explained that filleted fish and frozen seafood are not considered by the authorities to be "industrialized products" within the meaning of the Fishing Law, points out a July 12 dispatch from the United States Embassy at Guayaquil.

* * * * *

NEW FISHING COMPANY TO ERECT CANNERY: An executive decree has been issued authorizing the Minister of Economy in Ecuador to sign a fishing concession and industrial protection contract with a new company. The company will agree under the contract to erect a cannery in Guayaquil. The new concession will bring to five the number of fishing companies established in Ecuador, points out a dispatch of July 13 from the United States Embassy at Quito.

Finland

NEW LAW ON TERRITORIAL WATERS: The Finnish Diet on May 23, 1956, gave its final approval to a Government-proposed bill on territorial waters which presumably will be signed by the President and take effect in the near future. The bill is essentially a codification and clarification of existing practice, required by various changes in Finnish territorial boundaries and by the previous lack of any comprehensive law delineating Finland's territorial waters and clearly defining the basis therefor. In the Peace of Dorpat (Tartu) of 1920 with the Soviet Union, the Finnish waters in the Gulf of Finland were fixed at four miles but the limits in the Gulf of Bothnia had not been specified in any basic instrument.

The main principles applied by Finland in determining its territorial waters are (1) the four-mile limit of marginal sea common to the Scandinavian countries and, in the Gulf of Finland, the U.S.S.R., and (2) the "broken line" (rather than circular) method of drawing the base line for the marginal sea. (Using terminology of this bill, the line dividing inner and outer territorial waters, in addition to which the literature speaks of inland waters.) Islands situated outside the base line have territorial waters only three miles wide. However, the base line is extended between headlands or islands which are not separated by a distrance of more than twice the width of the marginal sea. Therefore, considering the provision in the bill that the inner territorial waters should be extended as far out as possible, the reference to islands outside the base line becomes academic in many cases because such islands will be within the base line.

According to the Director of Legal Affairs in the Finnish Foreign Ministry, the territorial waters resulting from the new law will differ little from the present definition and will not conflict with those of either Sweden or the Soviet Union. To avoid such conflict, the bill specifies treaty boundaries rather than the general limits in certain areas. Such exceptions are obviously necessary at the southeastern and northwestern limits of Finland's territorial waters, where the maritime frontiers are determinative out to the four-mile limit. In addition, near the former Finnish (now Soviet) island of Suursaari in the Gulf of Finland the 1947 Peace Treaty specified a Finnish maritime boundary somewhat less than three miles from the most southerly Finnish island. Similarly, the island Märket west of the Aaland Islands is both a point of the Finnish base line and an international boundary marker (half Finnish, half Swedish) under the 1811 Peace of Hamina.

Two other portions of the Finnish-Swedish maritime boundary, Marenkurkku about the middle of the Gulf of Bothnia and near Flötjan south of the Aalands, were drawn as a result of the Peace of Hamina within the Finnish territorial waters as determined by the new law. The Finnish Government regards the old boundaries as meaningless in these cases, according to the Director, because Sweden's territorial waters as presently defined do not meet those of Finland.

It can be assumed that the Finnish Government has been in consultation with the Swedish Government regarding these three points of possible conflict. Thanks apparently to Swedish restraint, channels of open sea have been left between Finnish and Swedish waters all the way to the head of the Gulf of Bothnia. Asked about the comparable situation in the Gulf of Finland, Professor Castren told the Embassy that there was no longer any difference of opinion among authorities on international law over its accessibility through international waters (United States Embassy in Helsinki, report dated June 4, 1956).

France

MARINE OIL MARKET: Fish oil in France is a very minor item in the over-all fats and oil picture. Outside of a small quantity of whale oil (which is used for edible purposes) and some sperm oil (which is used for the production of higher alcohols), nearly all of the fish oil used in France is of a very low quality. As an example, the leather industry uses it for leather stuffing.

Production in metropolitan France of sardine oil totals approximately 5,000 tons a year and does not seem to vary much from year to year. Morocco produces 1,500 to 2,000 tons a year. In the overseas territories, about 1,000 tons of sperm oil are produced. The total needs are estimated to be approximately 12,000 to 13,000 tons a year. Some of the foots from the partial refining of low-grade fish oils is used in the soap industry. This refining is not done, however, for the purpose of making the oil into an edible product.

A small quantity of refined edible oil is imported each year from Norway for fish canning. The amount for which licenses will be issued in 1956 is 600 tons. France does not permit the use of polymerized fish oil for edible purposes. They follow the same attitude as Germany in this respect, considering that the polymerization does something to the fish oil which makes it toxic under some conditions.

There is an import of from 500 to 1,000 tons of fractionated fish oil from South Africa. The grade imported is known as "Marinol K," a high iodine number fraction. The present value of this oil is about £120 (US$336) a long ton. In order to be attractive to the trade, this must sell at about 10 percent under the local cost of linseed oil. The French government committee does not make very much money

available for this product and sometimes it carries a compensatory tax, depending on the relative price compared with linseed oil. It is used mostly in the manufacture of core oils and paint, and there is apparently only one company which is importing this product.

The present duties on drying oils are now under suspension but, as stated above, there is a compensatory tax which is based on the price of the fish oil, compared with other drying oils such as linseed oil. There is an import of hydrogenated fish oil and whale oil in small quantities from Norway, but the amounts have not yet been obtained. Statistics for fish oil are very sparce in France since, in the past, they have, with the exception of cod-liver oil, all been put into a single category. It is expected that, beginning with 1956, both import and export statistics will be broken down, and there should be better reporting in the future for the different marine oils. Statistics regarding the production of fish oil are quite unreliable.

France has been unwilling to make available dollars for the importation of fish oils from the United States and it would appear that the market here is not very large unless some specialty oils, which would require intensive and specialized selling, were offered. The French government would also have to be persuaded that they are necessary for the promotion of industrial production.

This is one of eight reports on a survey undertaken by the U. S. Fish and Wildlife Service of markets for United States-produced fish oils with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 66, 71, 87, 90, 96, & 99 of this issue.

German Federal Republic

MARINE OIL MARKET: Germany is probably the largest fish and marine-animal oil consuming country in Europe. Again as in other countries in Europe the bulk of the oil is used for edible purposes. Out of Western Germany's total consumption in 1954 of 157,000 metric tons of whale oil and fish oil, approximately 35,000 tons were used for industrial purposes and 122,000 tons for human consumption. The United States furnished the greater part of Western Germany's imports of fish oils both for 1954 and 1955.

Table 1 - German Federal Republic's Production of Marine Fats and Oils, 1954-55

Type	1955	1954
	(Metric Tons)	
Whale fat and oil	n.a.	21,059
Cod-liver oil, crude	n.a.	2,050
Cod-liver oil, processed	n.a.	2,000
Other marine fats and oils	29,700	28,500

The single importer of United States menhaden oil in Germany purchases only untreated crude oil, having had considerable difficulty in past years with refining and bleaching other types of oils. The firm is now satisfied with the quality of the oil they are securing. They claim to have developed a process for refining and hydrogenation which gives them a product satisfactory for use in margarine and none of the oil they purchase, except for the foots from refining, is used for industrial purposes. They contend that some suppliers have in the past been in the habit of mixing "tank bottoms" and the resulting product has contained considerable dirt as well as excess stearine from settling.

There is no Solexol plant operating in Germany. There are two companies who produce fatty acids from fish oil and fractionate these, selling the resulting fractions for various purposes, such as the manufacture of alkyd resins, etc. Some hydrogenation of fish oil with splitting of the same is also effected. A good grade of stearic acid is produced by this method and finds a ready market. Both of these companies are located in the upper Rhine area.

Some of the smaller companies purchase their supplies of fish oil through a dealer in Hamburg. It is the practice of this dealer to purchase menhaden oil from

Table 2 - German Federal Republic's Imports of Marine Fats and Oils by Country of Origin, 1954-55

Type & Country of Origin	1955	1954	Type & Country of Origin	1955	1954
	(Metric Tons)			(Metric Tons)	
Whale Oil:			Other Marine Fats & Oils (Contd.):		
Denmark	0	21	Norway	7,874	9,770
Great Britain	151	10,267	Portugal	1,786	1,426
Iceland	0	859	Sweden	149	475
Netherlands	841	601	South African Union	2,284	5,759
Norway	36,871	60,145	Angola	6,198	0
Portugal	1,150	1,804	Spanish Morocco	32	449
South African Union	0	2,669	Port. West Africa	0	8,886
Japan	15,092	25,348	French Morocco	0	27
Panama	19,835	9,729	Vietnam	150	0
Peru	772	2,571	United States	31,780	34,180
British Guiana	9,150	500	Canada	1,235	2,680
Australia	5,389	5,723	Return goods	0	2
New Zealand	0	152	Unspecified	1	2
Unspecified	5	2	Total 1/	67,940	109,161
Total 1/	83,256	121,391	Hardened Fats & Oils: 2/		
Other Marine Fats & Oils:			Denmark	0	8
Belgium	633	5,598	Netherlands	83	12
Denmark	6,421	5,890	Norway	7,399	2,191
France	220	40	Switzerland	2	9
Great Britain	2,180	12,691	India	30	0
Eire	84	188	United States	30	14
Iceland	844	4,153	Return goods	1	0
Netherlands	6,067	21,946	Unspecified	0	13
(Continued in opposite column)			Total	7,545	2,247

1/ Totals may not add up due to rounding. 2/ Includes also non-marine fats and oils.

the United States as well as herring oil from other countries and blend the same to make a standardized mixed fish-oil product. The usual purchases by this dealer are in 300- to 500-ton lots. The firm sells out of storage tanks at Rotterdam thus saving buyers the cost of putting up money for letters of credit, etc.

This dealer prefers to purchase United States fish oil shipped from Gulf coast ports since the iodine number is less than that of the oil shipped from the Atlantic sea ports, particularly the oil shipped from northern ports.

Some feel that the reduction in imports of fish oil from the United States recently was due to the increase in imports of cottonseed oil, since the consumption of margarine containing fish oil declined whereas the consumption of the best grade of fortified margarine made from vegetable oils increased. The price of margarine is fixed in Germany and with the increase in the cost of vegetable oils some think that the manufacturer of the top-grade margarine will be forced to seek an increase in price and if this is granted then its consumption will possibly decline and the consumption of lower grades will increase. One of the independent producers of refined hydrogenated marine oils for the margarine trade informed us that whereas the content of the marine-oil portion of margarine used to consist approximately of 60 percent whale oil and 40 percent fish oil, it now consists of approximately 30 percent whale oil and 70 percent fish oil. Fish oil usually sells here in Germany at about 10 percent less than whale oil.

The following is the order preferred by German buyers of fish oil when they buy independently and do not purchase oil of a guaranteed iodine number by a principal buyer:

1. Canadian pilchard oil.
2. Norwegian and/or Danish herring oil.
3. Iceland herring oil
4. U. S. menhaden oil.
5. Angola, Moroccan, Portuguese, etc. fish oils.

The last category, we were informed, was only suitable for industrial use but again, we also heard, that these types of oil are mixed in with a better grade, on occasion, for refining and hydrogenating.

Starting this year Western Germany's official statistics on the production of fish products, including oil and meal, will be very good. At the present time some of the figures are included in other categories. As an example of this, hardened fish oil is included in the general category of "hardened fats and oils," for both imports and exports. These categories, of course, will include hardened vegetable oils and, as a consequence, it is impossible to obtain any accurate figures regarding exports of hydrogenated fish and whale oil. Some think that a greater part of the exports of hardened fats and oils consists of whale and/or fish oil while others feel that the amount is not so great.

Table 3 - German Federal Republic's Exports of Marine Fats and Oils by Destination, 1954-55

Type & Destination	1955	1954
	(Metric Tons)	
Whale Oil:		
Belgium	0	608
Italy	150	91
Switzerland	258	0
Unspecified	18	4
Total	426	703
Other Marine Fats & Oils:		
Great Britain	0	571
Italy	52	20
Netherlands	1,553	2,770
Norway	8,539	329
Austria	33	41
Rumania	0	10
Sweden	3,421	420
Switzerland	49	105
Spain	10	0
Czechoslovakia	0	763
Colombia	0	386
(Continued in opposite column)		

Type & Destination	1955	1954
Other Marine Fats & Oils (Contd.):	(Metric Tons)	
Uruguay	0	10
Unspecified	25	25
Total	13,682	5,450
Hardened Fats & Oils: 1/		
Belguim	0	41
Denmark	159	7
Eire	0	50
Italy	0	36
Netherlands	153	281
Austria	5,541	5,617
Switzerland	107	282
Czechoslovakia	0	475
Israel	1,537	793
Spain	5	0
U.S.S.R.	2	0
Uruguay	0	5
Unspecified	18	10
Total	7,522	7,597
Re-export of hardened fats & oils after processing	2,624	974

1/ Includes also non-marine fats and oils.

In Germany as is the case with all other countries the production of fish oil is incidental to the production of fish meal which is more valuable. There are occasions during the year when fish only have about 2 percent oil content, increasing later in the year to around 18 percent or over. In most countries fishing goes on and reduction of the same takes place irrespective of the oil content.

It would appear that Germany will continue to import large quantities of fish oil from the United States both directly and through transshipment at Rotterdam.

This is one of eight reports on a survey undertaken by the U. S. Fish and Wildlife Service of markets for United States-produced oils with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 66, 70, 87, 90, 96, & 99 of this issue.

Greece

STATUS OF THE FISHERIES, 1955: Fishing activity in Greece has been steadily on the increase since World War II. Through the application of a development program, sponsored and financed by the United States Aid Mission, the industry underwent modernization and expansion.

Before the war there were about 3,000 small boats engaged in offshore fishing, few of which were motor-driven. By 1955 the number of such boats had increased to 10,500 of which 2,500 were motor-propelled. The number of motor trawlers and purse-net boats increased from about 500 in 1938 to 683 in 1954 and 745 in 1955. Most of these boats are of postwar construction, and are all equipped with imported or locally-made Diesel or semi-Diesel engines. Many have cold-storage and radio-communication facilities and some even carry modern depth-sounding instruments. Since 1953 two medium-size open-sea fishing boats have been added to the country's fishing fleet.

Fish production has increased sharply since the war and by 1954 and 1955 the annual catch was 60,000 metric tons (25,000 to 35,000 tons prewar).

Greek Production of Fish and Sponges, 1935-38 and 1949-55

Item	1955	1954	1953	1952	1951	1950	1949	Avg. 1935-38
	(Metric Tons)							
Fish	60,000	62,000	52,000	43,000	45,000	55,000	45,000	30,000
Sponges	135	135	64	128	143	169	161	50

Fish processing has also made marked progress. There are now some 120 packing plants in Greece whose annual output is about 6,000 tons. There are also 2 fish canning plants with a total annual output of 500 tons.

Plans are under way for the construction of modern fish markets in a number of distribution centers, including Piraeus. These will be equipped with modern handling and storage facilities.

Progress is also being made in restocking and developing fresh-water fisheries, particularly in Northern Greece, with encouraging results.

The sponge fishing industry has also made considerable headway since the war, mainly because of the annexation of the Dodecanese Islands where sponge-fishing is an age-long tradition. Before the war there were about 100 vessels engaged in sponge fishing in Greek waters and along the North African coast, bringing in an annual catch of between 40 to 60 tons. In 1954, 144 sponge-fishing craft were in operation. In 1955 the number increased to 159. Production was 130 tons in 1954 and 135 tons in 1955. Competition from synthetic sponges has had an adverse effect on the demand for sea sponges, and exports are becoming increasingly difficult. However, there has been no accumulation of stocks in recent years.

Despite the very substantial progress made in agricultural and fishery production in the postwar period, Greece still depends on imports for a substantial portion of its food requirements. The list includes fresh and salted fish and fish products.

With the termination of the guerrilla war in 1949, plans for economic development began to take concrete form. A joint Greek Government-United States Aid Mission Central Loan Committee was set up in 1949 for the purpose of financing private Greek industrial and other productive enterprises. By 1954 a total of 259 loans on fisheries were made (embracing 202 projects) and the amount of the principal for these loans was $2.1 million, a United States Embassy dispatch from Athens (June 14) points out.

Exports of sea sponges (one of Greece's principal exports) were valued at US$1.5 million f.o.b. in 1952/53 and rose to US$1.7 million in 1953/54 and 1954/55.

Guatemala

COMMERCIAL FISHING POSSIBILITIES: A Guatemalan fish market operator has obtained a permit for engaging in commercial fishing in Guatemalan waters. Two boats of about 70 gross tons each are reported en route to the Caribbean to initiate operations there. Possibility of participation by a United States firm has been mentioned, points out a July 13 report from Guatemala.

Hong Kong

OYSTER PRODUCTION AND CULTURE: Under the supervision of the Hong Kong Fisheries Division 553,000 pounds of fresh oyster meats were harvested from the Deep Bay beds adjoining British territory. This quantity yielded almost 17,000 pounds of dried oysters and 36,000 pounds of oyster juice for export to the United States, plus a balance of 32,000 pounds of semidried oysters for local consumption.

Oyster piles at Ping Shan.

Experimental work continued at Deep Bay, where rafts and stands are being used to demonstrate the Japanese "hanging-drop" method of oyster culture. The Deep Bay oysters, which had earlier been transplanted to a different environment in Tolo Harbour, and are now suspended from rafts moored near Centre Island, continue to survive. These oysters are under careful observation and it is hoped that it will prove possible to introduce an edible oyster industry to this area.

Both the Deep Bay and Tolo Harbour investigations are being carried out as joint projects by the Fisheries Division and the Fisheries Research Unit of the University of Hong Kong, states a June 28 report from the United States Consulate at Hong Kong.

Iceland

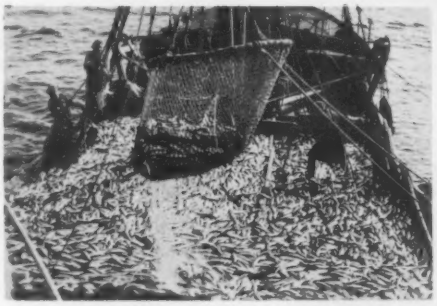
FISHERIES INCLUDED IN PROGRAM OF NEW CABINET: Included in the program of the new Icelandic cabinet are some plans for the fisheries. The Government will take up collaboration with the organizations of trade unions, farmers, and fish producers in order to find the best solution to economic problems. In consultation with these organizations, the Government will immediately appoint a committee of specialists to make a study of the economic situation, with the aim of achieving the best basis for Government policy decisions, reports a July 25 United States consular report from Reykjavik.

A decision has already been reached to seek the purchase of 15 trawlers and loan capital to finance such purchases.

The Government will work for extension of Icelandic territorial waters, and declares that extension of the fisheries limits around the country is a burning necessity for employment security.

* * * * *

NORTH COAST HERRING SEASON: The North Coast herring season thus far has been the best in many years with catches on some days being reminiscent of the good old days of the early Forties. The total North Coast herring catch as of July 21 stood at five times the catch as of the same date last year and twice the total for last year's entire North Coast season (table 1).



Icelandic fishing vessel brailing herring.

As of the time of writing, 240,000 barrels were salted, and salting operations were suspended except for a few small specialty orders. Unless new orders are received the boats will hence-forth deliver all catches to the reduction plants for production of meal and oil. While these are worthwhile export commodities they bring in, measure for measure of fresh herring consumed, only about a third the income in foreign exchange received for salted herring. Since salted herring is relatively perishable, Icelanders do not salt beyond actual contracts on hand. Attempts are now being made to sign new contracts for an additional 50,000 barrels with the Soviet Union and 10,000 barrels with Czechoslovakia. There are no contracts with United States buyers. Exports of herring products from the current season will begin after the middle of August.

Table 1 - Iceland's North Coast Herring Catch 1/ as of July 21, 1956

	1956			1955 (comparable period)		
	No. Bbls.	Wt./Bbl.	Total Met. Tons	No. Bbls.	Wt./Bbl.	Total Met. Tons
To Reduction Plants..	202,317	135 kg.	27,313	7,591	135 kg.	1,025
For Salting	217,354	135 "	29,343	81,210	135 "	10,963
For Freezing	7,280	100 "	728	4,328	100 "	433
Total			57,384			12,421

1/ Fresh whole herring.

It is to be noted in table 2 that for 8 out of the 18 years the catch was over 120,000 tons. This gives an indication of just how dreary the catch failures of the recent six lean years have been.

Table 2 - Iceland's North Coast Herring Catch 1/, 1938-55

Year	Met. Tons	Year	Met. Tons	Year	Met. Tons
1955	28,895	1949	62,656	1943	176,640
1954	26,618	1948	60,266	1942	145,663
1953	42,607	1947	122,382	1941	93,434
1952	11,123	1946	129,504	1940	235,052
1951	59,624	1945	51,816	1939	140,518
1950	31,989	1944	216,473	1938	184,674

1/ Fresh whole herring.

The technicians, who hardly dare to be hopeful, point out that consitions thus far are more those usually association with bad years than good. They refer to the distance of the herring from shore, their "premature" fatness, the food supplies in the sea, etc.

To put the impact of the catch in perspective, however, it may be recalled that herring last year accounted for only about 12 percent of the total catch both in quantity and value, in spite of a larger-than-usual assist from the South Coast herring season. The more important groundfish catch (88 percent of the total in value last year) as of June 30 this year was running 7 percent under last year (239,000 metric tons in comparison with 257,000 tons). The herring catch will accordingly have to be very good if it is to improve the situation to any important degree. So far it has not quite made up for the modest reduction in the groundfish catch, though it promises to do so very soon. Needless to say, if it continues at its present rate, it will greatly surpass last year's levels.

The Herring Production Board reports that advance contracts have been signed for sale of 250,000 barrels of salted North Coast herring (if available) and 80,000 of South Coast herring. The U.S.S.R. will take "up to 150,000 barrels," Poland 10,000 barrels, Finland 70,000-80,000, and Sweden 60,000-90,000 barrels. The Soviet taking would accordingly be about 20,000 metric tons, or almost double its over-all purchases of the last 17 months. Since herring products have gone in approximately equal quantities to Bloc and to free countries, a greatly increased catch would not necessarily affect substantially the Soviet Bloc's relative share of Iceland's export trade.

The Government has fixed the following guaranteed ex-vessel minimum prices on North Coast herring: 120 kronur per barrel of 100 kilos (US$3.35 per 100 pounds) of fresh whole herring for salting; this compares with 108 kronur (US$3.02) last year. The price for fresh herring delivered to reduction plants: 80 kronur per barrel (US$2.24 per 100 pounds) in comparison with 70 (US$1.96) last year, according to July 25 and July 17 reports from the United States Embassy at Reykjavik.

Approximately 200 motor boats and one trawler are participating in the North Coast herring season as compared with 132 motor boats and one trawler last year. The increase reflects the higher hopes roused by last summer's catch which was higher than that of the previous year.

Note: Values converted on basis of 16.26 kronur equal US$1.

India

NEW SHRIMP GROUND FOUND OFF COAST: The discovery of a rich new shrimp ground, extending 140 miles along India's Malabar coast, is reported by the Food and Agriculture Organization (FAO). The discovery, said an FAO expert in Rome, has already led to the start of a shrimp trawling industry and shrimp freezing for domestic and export trade. With other developments taking place on India's east coast, this has created a demand among Indian fishermen for mechanized boats, nylon nets, and other modern fishing gear.

An Icelandic master fisherman who has been working in Madras State since 1954 said he discovered the new shrimp ground while trawling with a 22-foot FAO boat. The shrimp run in a four-mile-wide strip about 140 miles long, average 4 to 5 inches in length, and are being caught at a rate of 100 pounds per hour's trawling with a 10 horsepower open skiff, he said. Fishermen could vastly increase their catches if they had mechanized boats, and could fish for shrimp in midwinter and spring as well as in the summer season when shrimp are caught in traditional bag nets while schooling on the surface.

Twenty 30-foot boats, designed by FAO naval architects, are nearing completion, he said, and the Madras State government has drawn up a five-year program of

fisheries' development which includes construction of mechanized boats. A private fish-processing company has leased a government freezing plant at Calicut and started a domestic and export trade in frozen shrimp.

The new shrimp ground is described by the Icelandic master fisherman as "a veritable gold mine... . I loaned our FAO boat to five fishermen I had trained and they caught 11,306 pounds of shrimp and fish from March 21 to April 18."

Italy

MARKET FOR IMPORTED FISHERY PRODUCTS: Greatly improved economic conditions, particularly in the last two years, plus the desire of the Italian Government to maintain a liberal trade policy, have recently resulted in the liberalization of additional products from the dollar area, including dried, salted and smoked fish. Fish falling within these categories may now be imported into Italy without import licenses or dollar allocations.

Canned fish, including salmon, is still on the list of restricted items. However, it is expected that sufficient dollars will again be made available to cover canned salmon for the 1956/57 season.

The Italian fishing industry, encouraged by various forms of Government assistance, has made slow but steady progress in modernizing its fishing fleet and improving shore facilities since 1945. However, the quantity of fish taken in recent years has shown little variation and total 1955 landings of 194,747 metric tons were only 155 tons above those of 1954.

Table 1 - Italy's Imports of Fishery Products, 1954-55

Product	Quantity	
	1955	1954
	(Metric Tons)	
Salted cod	55,137	43,330
Stockfish	6,845	6,406
Fresh & frozen fish	33,083	22,988
Herring, salted & smoked	4,202	4,080
Pilchards, salted	279	853
Anchovies & sardines, salted	797	975
Crustaceans & molluscs	2,490	1,940
Other fish, fresh, salted, or smoked	97	38
Salmon, canned	1,528	1,394
Sardines and anchovies, canned	10,640	11,616
Tuna, canned	7,435	8,037
Other fish, canned	5,379	4,451
Total	127,912	106,108

In postwar years, Italian fishing operations on the most prolific fishing grounds in the Adriatic, adjacent to the coast of Yugoslavia, have been restricted. In recent months, however, a Fisheries Agreement entered into between Italy and Yugoslavia has established the right of Italians to fish in designated zones of Yugoslav waters under certain conditions. At present, the agreement is only provisional and subject to ratifications, but the Italian fishing industry hopes that it will permit greater freedom to operate in these rich Adriatic waters and result in increased catches.

Italy's total imports of fish during 1955 rose 20.5 percent above 1954, largely because of increased purchases of salted cod and fresh and frozen fish. Most of the frozen fish imports consisted of tuna supplies by Norway and Japan for local canneries.

Italy's 1955 imports of salted cod from Canada showed a 19 percent decrease as compared with 1954. Canada's main competition comes from the heavy salted

dried fish from France. Most of the salted cod imported from countries other than France and Canada is wet-salted and is sold on the local market as such. Because of its low price, French fish has made serious inroads into sections of the Italian market which were formerly considered strongholds for hard-dried light-salted cod and, in particular, for Newfoundland shore fish. Imports of French fish have more than quadrupled since 1953, although consumer demand for the French product appears to be lessening.

Table 2 - Italy's Imports of Salted Cod, 1954-55

Country of Origin	Quantity	
	1955	1954
	(Metric Tons)	
France	17,543	8,326
Iceland	14,735	12,467
Denmark	7,488	11,315
United Kingdom	5,695	
Canada	3,464	4,276
West Germany	2,448	1,160
Other countries	576	2,056
Italian deep-sea fisheries	3,188	3,730
Total	55,137	43,330

Canada's exports of canned salmon to Italy continue to increase and shipments during 1955 rose to 1,484 metric tons, or 123 tons more than in 1954. Most of this salmon, however, was shipped in the first half of 1955 and consisted of 1954 production. The drastic decline in last season's catch of chum salmon (which, because of its lower price is the best seller in Italy) will no doubt be reflected in Italian import figures for 1956. However, increased purchases of pink salmon may help to offset the decrease in the amount of chum available.

Slow sales and larger-than-usual stocks at the turn of the year caused considerable pessimism in the Italian salt cod trade. However, severe weather conditions during February and March curtailed local fishing operations and demand for salt cod again became active. Sales have continued to be fairly brisk and it is expected that, for the most part, stocks will be disposed of by the beginning of the new season. By that time, import demand should be normal.

Canadian canned salmon may encounter increased competition but there should be no difficulty in maintaining sales provided prices remain competitive. Canada's exports of fish to Italy have usually consisted of salted cod and canned salmon, but now all fish coming within the categories of dried, salted, or smoked may be imported freely from dollar areas, states the July 7 (Canada) Foreign Trade.

Japan

NORTH PACIFIC FACTORYSHIP SALMON CATCH THROUGH JUNE 5: The 1956 Japanese salmon factoryship expedition of 12 factory ships, 315 catcher boats and 60 scout boats had caught 7,269,744 salmon (number of fish) through June 5, 1956, according to the June 7 issue of Hokkai Suisan, a Japanese periodical. This total is lower by 24.3 percent than the 9,609,094 fish reported through the same date in 1955. As of June 5 fishing operations had not begun in the Okhotsk Sea.

Japanese Factoryship Salmon Catch in North Pacific Through June 5

Species	1956	1955
	(No. of Fish)	
Sockeye	2,059,597	3,739,428
Pink	130,379	529,955
Chum	5,074,352	5,332,848
Coho	45	61
Spring	3,371	3,802
Other	2,000	3,000
Total	7,269,744	9,609,094

The composition of the catch through June 5, 1956, also changed when compared with the same period in 1955 with chums making up 69.8 percent of the 1956 catch as compared with 55.5 percent in 1955. The reverse was true for the 1956 catch to date of sockeye which declined to 28.4 percent as compared with 38.9 percent for the similar period in 1955.

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SALMON AND CRAB CATCHES REPORTED GOOD: Despite earlier pessimism, Japanese salmon fishing fleets in the Russian restricted area are faring very well and it appears possible that the limit will be caught by the August 10 deadline. One fleet of 27 catcher boats is reported to have caught just under their season limit by July 24. This fleet, however, is operating at 51° 18' north latitude, 157° west longitude, an advantageous location because large numbers of fish pass through the Kurile Straits. There is more optimistic feeling concerning the salmon fishing in the Russian restricted area than there was earlier, but over-all figures for the catch to date are not available.

The crab catch in the Bristol Bay area was last reported to be favorable and crab fleets have reported packs near the goals set for this season, states a July 27 United States Embassy dispatch from Tokyo.

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FISH MEAL PRODUCTION AND EXPORTS: There was a drastic reduction in the amount of fish meal produced in Japan during the postwar period when every fish caught was needed for human consumption because of the food shortage. However, in 1952 production of fish meal (table 1) began to pick up and exports were resumed. No official statement for the production in 1955 has been issued as yet. The lack of exports to the United States during 1954 and 1955 has been attributed to the fact that shipments were diverted to Europe to take advantage of the low freight rates prevailing as a result of the freight war that existed between the Japanese Homeward Freight Conference and the Mitsui Steamship Company Ltd., but recently this disagreement was resolved.

Table 1 - Japanese Fish Meal Production for Animal Feeding and Fertilizer, 1953-54

Type	1954	1953
	(Metric Tons)	
Herring scrap	1,600	13,100
Sardine scrap	7,600	11,900
Fish scrap	35,800	27,500
Dried sardine	500	1,600
Fish meal	19,300	n.a.
Others	38,900	41,500
Total	103,700	95,600

At the present, exportation of fish meal has been halted as of July 1, 1956, because of the temporary withholding of licensing approval by the Fishery Agency of the Japanese Ministry of Agriculture and Forestry, although shipments under long-term contracts are allowed to continue. The reason for the stoppage is traced to the current shortage of fish meal that resulted from the low catches of fish and which brought a sharp rise in price. However, the price of fish meal has dropped and the producers of fish meal are seeking the abolition of the restriction. It was expected that licensing of exports would commence again in September of this year.

Table 2 - Japanese Exports of Fish Meal by Country of Destination, 1953-55

Country of Destination	1955	1954	1953
	(Metric Tons)		
Belgium	441	-	498
France	-	162	-
West Germany	2,792	-	-
Switzerland	-	-	98
Netherlands	-	-	200
United States	-	-	2,225
Philippines	122	269	366
Taiwan	23	-	-
Hong Kong	34	123	81
Mexico	-	189	-
Singapore	-	62	46
Ryukyus	31	78	169
Total	3,443	883	3,683

Production of fish meal in Japan consists of two kinds. There is the white-fish meal made from white meat fish such as cod, Alaska pollock, Atka mackerel, etc.;

most of this fish meal is used for animal feeding and exports. The other kind is the brown fish meal made from red-meat fish such as sardines, herring, and saury pike, and used more for the manufacture of fertilizer. According to the Japan Fish Meal Exporters Association, production of fish meal is not expected to reach prewar production for some time to come. The increasing restrictions imposed on Japanese fishermen by neighboring countries have narrowed the areas where they may still catch fish and has led to a material reduction in the amount of fish landed available for fish meal production. It is, therefore, no longer profitable for a large fishing company to operate a large fish meal plant. Production is consequently drifting into the hands of small enterprises who produce fish meal when the weather in a particular locality is not suitable for processing fish into salted or dried products or when a large catch is landed in an isolated area. The recent restriction on exports has also discouraged fish-meal production. The decline in fish meal from the prewar period may be seen in table 3 which contrasts the production and exports in the prewar and postwar periods.

Table 3 - Comparison of Japanese Fish Meal Production and Exports in Prewar and Postwar Periods

Year	Total Production of Fish Scraps & Meal	Exports of Fish Meal	
		Total	U.S. Only
	.....(Metric Tons).....		
Prewar:			
1937	333,000	89,100	56,200
1936	450,000	67,400	47,200
1935	374,000	57,900	32,800
Postwar:			
1956 (Jan.-June)	n.a.	7,900	n.a.
1955 est.	135,000	3,443	-
1954	103,700	883	-
1953	95,600	3,683	2,225
1952	95,000	627	48

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REVIEW OF JAPANESE FISHERIES, 1955: A large-scale recovery of Japan's prewar position and a growing awareness of her stake in international measures for conservation of resources and stabilization of the industry marked the year 1955 in the fisheries of Japan.

The overwhelming majority of the Japanese people live on the seacoast of their island country. With agriculture limited for the most part to the narrow belt of land between the shore and the nearby mountains, the Japanese have tended to view the vast expanses of the seas which stretch out all about them as their pasture lands, their "West," their ever-expanding frontier encompassing the territory necessary to produce the food needed by their ever-increasing population. In the words of a Japanese familiar with both ways of life, the oceans are to the Japanese people what the wheat fields of the midwestern plains are to the American people. Fish is not a once-a-week food to the Japanese nor a substitute to be bought when the price of meat is high; 80 percent of the animal protein content of the Japanese diet comes from fish, and the health of the people would deteriorate rapidly if they did not have the resources of the seas at hand.

The total catch of all Japanese marine fisheries in 1955 was about 5,150,000 metric tons (about 11.3 billion pounds), compared with about 4,650,000 tons in 1954 and about 3,500,000 tons in 1938. While the 1955 catch represented an increase of about 10 percent over the figure for the previous year, there were notable increases and decreases in the catch of individual species. The salmon catch, for example, was about three times that for 1954, and the catch of saury pike was up 72 percent. The herring catch, on the other hand, continuing its downward trend, was only about one-third of the 1954 level and 15 percent of the 1952 catch, states a July 13, 1956, dispatch from the United States Embassy in Tokyo.

Exports from Japan in 1955 of fish and fish products totaled 155,108 metric tons, valued at US$75.6 million, an increase of 10 percent in volume and 2 percent in value over 1954. Exports of other marine products (including whale oil, pearls, fish oil, agar-agar, shells, dried seaweed, and seed oysters), amounted to 64,680 tons, valued at US$30.3 million, which was 2.5 times the 1954 exports in volume and 1.5 times in value; the increase was accounted for almost entirely by shipments of whale oil, which rose from 9,000 to 45,000 tons.

Tuna: United States interest in Japanese fisheries was centered in 1955 on the tuna and salmon industries. For several years prior to 1955 shipments of frozen tuna, particularly those of albacore (white meat) tuna, from Japan to the United States had been increasing at a rate which caused considerable alarm to American fishermen. During the first five months of 1955 Japanese Government approvals for the shipment of albacore totaled almost 25 percent more than those of the same period of 1954, and by June 1 the situation in the California tuna fishing and packing industry was acute. While the Japanese Government controlled the price of albacore for export under a "check price" system which was designed to equalize the cost of Japanese fish with the current American price, it was reported that the financial difficulties of some Japanese firms were forcing them to violate the law and sell below the check price, which in turn aggravated the situation. In the face of mounting public pressure in the United States for controls on the import of Japanese tuna, the Japanese industry undertook to put its own house in order. In June a cooperative association was formed to control the export of frozen albacore, and thereafter all orders were channeled through that association. The check price was reduced from US$300 a short ton, which was considered too high to be enforced, to US$270 a ton. In order to hold the line firmly at this price, the association guaranteed to buy albacore at US$270 from any exporter who was forced to sell because of financial difficulties, thus ending the pressure for sales below the check price.

The association also established a ceiling on exports of albacore for June and July 1955 of 15,000 tons, as compared with approximately 10,000 tons approved for export during the same months of 1954. This figure was considered unreasonably high in the United States, and protests continued. Moves were started, with the backing of the American tuna fishing industry and certain of the canners, for Congressional action to limit imports of albacore, or for the imposition of a customs duty. The matter was further complicated, however, by the fact that a number of tuna canners located in the Pacific Northwest are not served by the American fishing fleet but depend mainly on Japan for sources of raw fish and so were opposed to restrictions.

As the summer fishing season progressed it became evident that the size of the albacore catch would not be as great as had been expected, and Japanese Government approvals for the export of albacore to the United States totaled only slightly over 9,000 tons, far short of the association's quota and less than the total for the same period of 1954. The same tendency continued throughout the rest of the year, and export approvals for the last seven months of 1955 were only a little over 18,000 tons, or 1,500 tons less than the same period of 1954. The total for the year ended up about 1,000 tons more than 1954. While this total still represents more of a share of the United States market than may be considered reasonable by the American tuna fishing industry, it nevertheless marked a halt in the previous rapid rate of increase.

During 1955 the Japanese Government continued to place restrictions on the building of new tuna boats, new licenses were limited, and the operating period, tonnage, and catch of the boats now in use were continued under regulation.

The concern of the United States with the Japanese tuna industry is solely one of trade, affecting Japanese shipments of canned and frozen tuna to the United States.

The United States and Japanese fishermen have no conflict over the catching of tuna, since they operate in different areas of the seas.

Salmon: The United States interest in the Japanese salmon industry, on the other hand, is dual: to a large extent United States and Japanese fishermen compete for the same fish, while the canning companies compete for markets. The American (and Canadian) salmon fisheries, moreover, are fundamentally different from those of Japan. The United States and Canada maintain close scientific control over the rivers on the North American continent where the salmon return to spawn, and the catch is taken off the mouths of these rivers in amounts calculated to allow the optimum number of spawning salmon to escape into the rivers. The Japanese have extremely few salmon-producing rivers, and conduct their fishing by means of nets on the high seas. It is the United States contention that the salmon produced from North American rivers should be reserved for catching by United States and Canadian fishermen under controlled conditions, and this principle was recognized in the Japan-Canada-United States Tripartite North Pacific Fisheries Convention. Under that Convention, the Japanese agreed to refrain from fishing for salmon in the area east of a line located approximately at 175° west longitude, which was taken tentatively to mark the limits of the area inhabited by salmon of North American origin.

The Japanese salmon fisheries were signally successful in 1955. Twelve cannery ships, each accompanied by a fleet of fishing vessels, operated in the North Pacific to the west of the Convention line, while two other fleets fished in the Okhotsk Sea for the first time since the end of the war. Though the Japanese salmon catch was still considerably below prewar levels, it was about three times as large as that of 1954, which in turn had been much larger than the 1953 catch. The total pack of canned salmon reached 1,780,000 cases, nearly triple the 1954 figure of 625,000 cases.

During the 1955 season the salmon runs in a number of North American rivers were very poor, giving rise to a belief on the part of some American fishermen that the Japanese high seas catch had taken its toll of the North American salmon, in spite of the fact that the Japanese fishing had been conducted well to the west of the Convention line. Research was being currently conducted under the terms of the Convention to trace the migration of salmon and to establish more definitely whether a line could be drawn to divide the North American salmon from those of Asiatic stock, but the results of this research were not yet positive enough to show whether the salmon taken by the Japanese were in fact of North American or Asiatic origin. The Japanese fishermen believed that the salmon which they were catching during the 1955 season were in the process of migrating toward the Asiatic continent, and it was a fact that the Japanese North Pacific fleets moved constantly westward as the season progressed.

It was under these circumstances that the 1955 meeting of the International North Pacific Fisheries Commission, established under the tripartite Convention, opened in Tokyo in October. The Commission's committee on biology and research met on October 24, followed by the full annual meeting which began on October 31 and ended on November 5. The ideas of both the North American and Japanese sides were given full expression at these meetings, and although no final conclusions were reached on the main topic of discussion, the delegates obtained a clearer understanding of the problems being faced on both sides.

The Japanese salmon industry also experienced difficulties in selling the increased pack of canned salmon which resulted from the bountiful catch. The poor catch on the North American side made it possible for the Japanese to sell about 500,000 cases in the United States and another 150,000 cases in Canada. In 1954 Japan had sold somewhat over 200,000 cases of canned salmon to the United Kingdom, which was considered Japan's prime market. The Japanese hoped to triple

this amount to over 700,000 cases in 1955, and negotiations towards that goal were included in the United Kingdom-Japan talks on their over-all payments agreement. The British were unwilling to consider this large increase, in spite of efforts made directly with the British Government in London by the Japanese Minister of Agriculture and Forestry. A compromise was finally reached, however, which provided for exports to the United Kingdom of somewhat over 400,000 cases, or double the previous year's market.

Crab: In 1955, as in previous years, the Japanese sent a fleet to Bristol Bay to fish for crab. Two additional exploratory crab fleets were also sent in 1955 to the Okhotsk Sea. No Japanese fishing had taken place in the Okhotsk Sea since the end of World War II, but the 1955 expeditions showed that the possibilities for crab fishing there were excellent. The total pack of the three crab fleets was about 210,000 cases, of which two-thirds were taken in the Okhotsk Sea.

An irritating and potentially disruptive incident occurred in Bristol Bay when the United States and Japanese crab fleets came into conflict over the interpretation of an informal agreement establishing the distance to be maintained between fleets. A temporary amicable solution was reached, and the matter was discussed further at the time of the Tokyo meeting of the International North Pacific Fisheries Commission. Arrangements were then made by which each fleet will keep the other notified of its position and fishing operations, and maintain a specified distance from the area being fished by the other fleet.

Coastal Fisheries: While the interest of other countries is mainly in Japan's high-seas fisheries, such as those for tuna and salmon, the Japanese people themselves are more concerned in their daily lives with their coastal fisheries, in which 88 percent of the fishermen are engaged but which produce only 44 percent of the catch. Much of Japanese fishing is done by small groups of men in light boats within sight of the shore; while this type of fishing is convenient from the point of view of time spent away from home and availability of the fishermen for other work on days when fishing is not feasible, it is highly inefficient in yield per man hour. In August 1955 the Japanese Government issued a "White Paper" on the coastal fisheries in which a number of moves were recommended for the improvement of this phase of the fishing industry. In prewar days, according to the "White Paper," the coastal fishermen accounted for three-quarters of Japan's total catch. As larger and more efficient vessels have been built, however, and have ranged farther and farther from Japan in search of better fishing grounds, the balance has swung in favor of the high-seas operations. The Japanese Government hopes, over a period of years, to make it possible for coastal fishermen to band together, build larger boats, operate where the best fishing grounds can be found, and utilize scientific fishing methods to increase their catch relative to the time and energy expended.

Fisheries Relations with Other Nations: Relations in the fisheries field between Japan and the other nations of the Far East continued to be difficult in 1955. The Soviet Union has since the end of the war made a practice of seizing Japanese fishing boats which wander over the line separating Japan proper from Soviet-held territory. The number of such seizures in 1955 was 125, double the 1954 figure. The same number of ships was returned to Japanese custody, however, leaving the number still in Russian hands at the end of the year the same as it was at the beginning, 46. A total of 1,103 Japanese fell into Soviet hands in this manner, of whom 1,092 were allowed to return during the year, the other 11 being added to the total of 34 who were in Soviet custody at the beginning of the year.

It will be recalled that during the Allied Occupation of Japan the Japanese fishermen were kept within an area close to Japan bounded by what was called the "Mac Arthur Line." When, shortly prior to the coming into force of the Peace Treaty in April 1952 the "MacArthur Line" was abolished, a new line off the coasts of Korea was proclaimed by President Syngman Rhee of the Republic of Korea as the line

setting off those portions of the high seas in which the people of Korea had a special interest, and which the Korean Government intended to reserve for exploitation by Koreans. Japanese fishing boats were warned that crossing the "Rhee Line" would be a violation of Korean law, and that violators would be apprehended and punished. At the beginning of 1955, 88 Japanese vessels and 242 men were being held in the Republic of Korea for violation of the "Rhee Line." During 1955, 30 more boats and 498 men were seized, of which one boat and 15 men were released during the year; the totals still in custody at the end of 1955 were therefore 117 vessels and 725 men.

Most of the boats and fishermen held in Korea are from the Kyushu and Southern Honshu areas of Japan, and the public feeling in those areas against the Republic of Korea ran high in 1955.

The communist Chinese Government in Peiping did not lose any time after coming into power on the mainland before beginning to seize its share of Japanese fishing boats. While there was no specific area mapped out by the Chinese into which Japanese vessels were forbidden to enter, such vessels as ventured into waters in which Chinese gunboats happened to be operating frequently found themselves fired upon and captured. At the beginning of 1955 there were 104 Japanese boats in communist Chinese custody. No seamen were being held, however, since the Chinese had previously returned the crew members.

The communist Chinese tactics during 1955 were different, however. The Japanese Government maintains normal diplomatic relations with the Nationalist Chinese Government in Taiwan, and has no official ties with the Chinese communist regime. The opening of diplomatic ties with Japan has been and continues to be one of the major policies of the Peiping Government. In line with this policy, the communist Chinese in 1955 proposed a fisheries agreement with Japan under which the fishing vessels of each country would be able to operate in specified areas without fear of interference from the other country. The Japanese Government refused to participate in the negotiation of such an agreement, but the private fishing interests met with the Chinese and signed an agreement having many of the earmarks of a government-to-government treaty. Under this agreement the Japanese fishermen are not guaranteed the right to fish anywhere on the high seas without interference, but are allotted certain sections in the Yellow Sea and East China Sea in which to carry on their operations. Other parts of the agreement provide for safe harbors for fishing vessels on both sides and mutual recognition signals. In keeping with their new tactic, the communist Chinese seized only one Japanese boat in 1955, and both it and its 10-man crew were returned.

Although in past years Japanese fishing vessels have been subject to seizure by the Chinese Nationalist Government for violation of the regulations of that government, no such seizures took place in 1955. The 30 boats and 11 men held by the Nationalist Government at the end of 1954, however, continued to be held in custody.

The restrictions imposed by the Australian Government on the pearl-shell fishery in the Arafura Sea continued in force during 1955, and the Japanese pearl-shell fleet operated within the scope allowed by the Australian authorities.

From September 30 to October 14, 1955, Tokyo was the scene of the Sixth Annual Meeting of the Indo-Pacific Fisheries Council of the United Nations Food and Agriculture Organization. Representatives of 16 nations, including the United States, discussed problems relating to inland fisheries and fish culture, sea fisheries, and shrimp culture.

Conclusion: The Japanese by the end of 1955 had regained their prewar fisheries position insofar as the catch was concerned. The wartime interval and the years of the Occupation, however, had covered a period in which the international forces which bear on Japan's access to fishing grounds and to markets had shifted,

and Japan has not yet been able to complete its adaptation to the new situation. The world situation is such that it can be expected that difficulties between Japan and certain other countries will continue, but the preeminent position of Japan among the fishing nations, and the economic need of Japan for foreign trade, will be powerful factors in determining Japan's policies towards the rest of the world.

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NORTH PACIFIC WHALING EXPEDITIONS, 1956: One of the two Japanese fleets which will participate in the annual North Pacific whaling operations departed from Yokohama on May 8. The fleet, jointly operated by three major Japanese whaling companies, consists of an 11,448-ton mothership, the Kyokuyo Maru, 8 catcher boats (including a scout boat), 4 refrigerated vessels and 15 transport vessels. Whaling will be carried out until the end of September.

The catch for this fleet is estimated at 2,060 whales including 1,560 baleen whales (limited by law to 1,560 baleen whales or 800 blue-whale units) and 500 sperm whales. The 1955 catch was 1,568 baleen whales and 585 sperm whales.

On the basis of the estimated catch, production will amount to 29,665 metric tons valued at ¥2.2 billion (about US$6.1 million), divided as follows; baleen oil 10,948 tons, sperm oil 3,500 tons, whale meat 15,217 tons.

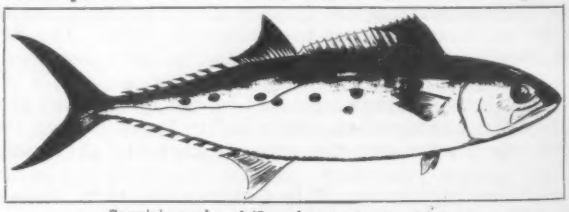
In 1955 this fleet's production amounted to 26,887 metric tons of products of which 15,192 metric tons were oil.

The second Japanese fleet will participate in North Pacific whaling later in the season but will limit its catch to sperm whales. Detailed plans for this fleet are not yet available but its catch last year consisted of 499 sperm whales which yielded 4,990 metric tons of products, states a June 4, 1956 dispatch from the United States Embassy in Tokyo.

Mexico

VERACRUZ FISHERIES TRENDS, MARCH-JUNE 1956: Veracruz fishermen on the east coast of Mexico caught 500 metric tons of mackerel in March and nearly as much in April 1956. In May the catch dropped to 229 tons. Little fishing was done in June. The catch in the second quarter of 1956 was valued at 2 million pesos (US$160,000) ex-vessel.

Veracruz needs about 2 million pesos (US$160,000) to recondition its refrigeration plant in order to preserve the catch and expand its fishing industry.



Spanish mackerel (Scomberomorus maculatus)

Within the next 5 or 6 months Tabasco expects to see increased ice production and the building of a refrigeration plant for the shrimp catch.

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LAW ON EXPORTS OF SPINY LOBSTERS CLARIFIED: A Mexican official in the office of the Director General of Fishing of the Ministry of Marine informed the United States Embassy in Mexico on June 8 that the Mexican law relating to the exportation of spiny lobsters appeared in the Diario Oficial of March 12, 1956, and

it clearly states that the exportation of spiny lobsters caught between parallels 23 and 29 in the Gulf of California shall be entered through the port of Nogales at all time during the entire open season (Nov. 1-April 15) in that area. He added that he saw no reason why the lobsters have to be exported exclusively through the port of Nogales during the general open season but that unfortunately the wording of the decree in the Diario Oficial specifies that spiny lobsters caught in the Gulf of California shall be exported through the port of Nogales during the entire open season for that area.

The official from the Ministry of Marine indicated that if there were sufficient pressure from the interested parties to get this provision of the law changed, the Mexican authorities would probably agree to do so. He pointed out, however, that the special authority conferred by this decree is temporary and expires on April 15, 1957, at which time presumably new regulations will be issued covering the exportation of lobsters from the Gulf of California.

* * * * *

PLANS FOR NEW SEAWEED PROCESSING PLANT: A Mexicali firm has announced plans to establish a US$500,000 plant in Ensenada, Mexico, to process seaweed (Pacific kelp, Macrocystis pyrifera) for medicinal and industrial purposes. The firm, which is reportedly being formed wholly with Mexican capital, has been granted a concession for the purpose by the Ministry of Marine.

Netherlands

MARINE OIL MARKET: The Netherlands is probably the second largest distributor of marine oils in Europe. In spite of the fact that the population is only a small percentage of the population in Germany, the distribution of marine oils in 1955 was quite large.

The Netherlands production of fish oil, whale oil, and sperm oil for the years 1949 through 1955 is shown in table 2.

The production of fish oil has increased from approximately 1,000 tons in 1949 to about 5,000 tons for the past 3 or 4 years. There are 3 sizable fish reduction plants in Holland and one very small one. The oil is produced principally from offal received from the curing of herring. There are some occasions when the catch is too great to handle and then whole herring are shipped to reduction plants. This is only done at times when the herring are unfit for food use. As in other countries the fish reduction plants are operated primarily to secure the fish meal. One of the reduction plants also is a renderer of tallow and grease. This firm also operates a refinery at a different location. Formerly it produced a grade of polymerized refined oil which was used in fish canning. It has discontinued polymerizing oil and now merely reduces the free-fatty acid content to 0.1 percent and bleaches the oil. This oil is then sold to hydrogenators for manufacture into oil suitable for use in margarine.

Table 1 - Netherlands Distribution of Marine Oils

	Metric Tons
Exports:	
As such	3,789
In margarine	7,967
In cooking fats	1,497
Other	423
Total exports	13,676
Consumption:	
In margarine	41,416
In cooking fats	3,445
Total edible consumption	44,861
Technical use	938
Waste	1,204
Miscellaneous disappearances	2,277
Ending stocks Dec. 31	14,506
Total Distribution	77,462

The surveyor was informed that in the Netherlands it is not customary to make mixtures of whale oil and fish oil in the hydrogenated form. These hardened oils

Table 2 - Netherlands Production of Marine Oils, 1949-55

Type	1955	1954	1953	1952	1951	1950	1949
	(Metric Tons)						
Fish oils	4,979	5,347	5,135	4,794	4,350	2,460	1,090
Whale oil 1/	5,679	15,376	17,345	15,752	15,505	13,248	17,967
Sperm oil 1/	77	1,016	30	-	422	606	558
Total	10,735	21,739	22,510	20,546	20,277	16,314	19,615

1/ Whale oil and sperm oil data represent those portions of the production by the Dutch whaler (Willem Barentsz) which were actually brought into the Netherlands and do not represent the total production by this whaler.

are sold separately and the margarine manufacturers make their own mixture. There is no great surplus of oils suitable for hydrogenation in the Netherlands. American menhaden oil is liked here in the Netherlands. There have been no complaints from those who have imported only directly from producers for the last two years.

Table 3 - Netherlands Imports of Fats & Oils from Fish & Marine Animals by Country of Origin

Country of Origin	1956 (Jan.-Mar.)	1955	1954
	(Metric Tons)		
Belgium/Luxembourg	-	937	831
Great Britain	-	3,471	8,866
France	-	391	230
Western Germany	-	768	794
Ireland	-	16	-
Iceland	-	900	1,759
Norway	404	2,267	3,532
Denmark	-	496	87
Czechoslovakia	-	276	-
Tangiers	-	-	27
French Morocco	-	73	123
Port. East Africa	-	-	204
South-West Africa	-	-	28
Union of South Africa	-	521	860
United States	2,408	14,321	9,734
Canada	-	1,039	118
Peru	-	200	50
Falkland Islands	-	-	611
Japan	75	2,734	47
Australia	-	-	7,375
New Zealand	-	253	-
Sea	1,193	29,260	15,979
Total Imports	4,497	57,685	51,258

Source: Central Bureau of Statistics

There are two fairly large dealers in fish oil located in Rotterdam. These are old established companies. These companies cooperate frequently; buy and sell on joint account. They also deal in other fats and oils and maintain stocks in the Rotterdam area. Representatives from these two companies plan a joint trip to the United States later in the year to look into the menhaden oil situation. They have not bought very much oil this season since they feel that the present price is still too high even though it has declined from $224 per short ton to a level of $213 per ton c.i.f. Rotterdam.

As in other countries in Western Europe, one internationally known firm handles the greater portion of both fish and whale oil used in the Netherlands. Some people have estimated that it controls between 80 and 90 percent of the business and its actions, of course, dominate the trading picture.

All established companies in the fat and oil business complained that since the war there has been a flock of new dealers that have entered the field. This has caused considerable fluctuation in prices, since frequently trading takes place between these operators rather than with actual consumers of the oil.

It is quite difficult to secure accurate figures regarding the actual use and consumption, and even the official figures issued by different branches of the Government vary. Practically all of the fish oil used in the Netherlands goes for edible

purposes. Discussions with the firm which represents the South African solexol plant owners indicated that sales for the past two years have been negligible and only occasionally do they sell one or two drums of the fractionated product.

Table 4 - Netherlands Imports of Whale Oil, Fish Oils, and Sperm Oil, 1/ 1949-55

Year	Oil			Total
	Whale	Fish	Sperm	
	(Metric Tons)			
1955 2/	33,800	15,100	3,360	52,260
1954	46,850	20,670	2,890	70,410
1953	47,220	8,720	2,120	58,060
1952	29,960	16,780	1,590	48,330
1951	42,840	16,310	1,630	60,780
1950	36,300	24,960	2,750	64,010
1949	27,840	5,130	1,930	34,900

1/ Includes supply from Dutch whaler Willem Barentsz.
2/ Preliminary.
Source: Marketing Board for Margarine, Fats and Oils.

Table 5 - Netherlands Whale Oil in Margarine, 1948-55

Year	Whale Oil		Total Prod. of Margarine
	Percentage	Qty.	
	%	(Metric Tons)	
1955	24.5	41,416	206,101
1954	21.7	35,703	200,225
1953	22.0	35,049	193,058
1952	19.2	29,233	184,574
1951	23.7	34,082	173,117
1950	24.4	34,894	172,169
1949	12.3	15,026	146,489
1948	21.1	18,757	107,256

Source: Marketing Board for Margarine, Fats, and Oils.

People engaged in paint manufacturing in the Netherlands prefer linseed oil which they claim produces a better grade of paint more suited to the damp climate of the Netherlands.

Everybody interviewed indicated that there would be no difficulty in selling the entire surplus production of menhaden oil from the United States this year and felt that the use of fish oil in Western Europe would grow since the population is increasing and the per capita consumption of fat products is also increasing. Increase in the production of palm fats, whale oil, and other liquid oils generally is not increasing at the same rate as the increase in consumption.

This is one of eight reports on a survey undertaken by the U. S. Fish and Wildlife Service of markets for United States-produced oils with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 66, 70, 71, 90, 96, & 99 of this issue.

New Caledonia

MARINE PRODUCTS INDUSTRY: Although the waters of New Caledonia abound in marine life, the only marine product which is exported is trochus shells. In spite of the firm price for trochus shells--about 50,000 francs (US$785) a ton in 1955--the amount of trochus shells exported during the year totaled only 723 metric tons as compared to

New Caledonia Fishery Products Imports by Country of Origin, 1954-55

Country of Origin	Quantity		Value			
	1955	1954	1955	1954	1955	1954
	(Metric Tons)		(CFP Francs 1,000)		(US$ 1,000)	
France	15.6	19.2	1,195	1,286	19	20
French Union	28.1	53.7	1,533	1,937	24	30
Australia	12.5	11.0	985	797	15	13
United States	68.3	42.2	2,409	1,603	38	25
Other Countries	65.9	96.6	1,944	2,581	31	41
Total	190.4	222.7	8,066	8,204	127	129

880 tons in 1954. This decrease is caused by depletion. During the year an expert of the French Institute of Oceania (Institut Francais d'Oceanie), a scientific research organization with headquarters at Noumea, began studies as to how trochus stocks may be regenerated.

Providing fish for local consumption does not occupy a large number of fishermen and demand for fish was supplemented in 1955 by the importation of canned fish

valued at 8,066,000 francs (US$126,600). It appears that the fishermen themselves limit the amount of fish caught in order to maintain prices.

A small fish cannery (established in 1951) on the northern tip of the Island, has not been very successful due to the irregular supply of fish.

Note: Values converted on basis of CFP franc equals 1.57 U. S. cents.

Norway

MARINE OIL MARKET: Norway is the largest fish-oil producing country in Europe and the production consists principally of herring oil. It is probable that the production will continue to grow since, like in Denmark, the trade feels that European participation in whaling will probably decline on account of the greatly increased costs of operating whaling units. The Norwegians have done a lot of research work in the handling and refining of fish and whale oils. Whale and fish oil constitute about 60 percent of the fat content of margarine produced in Norway and the quality of the margarine is such that it has been exported to many countries with success. It is also used as shortening in Norway since the taste of the margarine on heating does not become objectionable.

Table 1 - Norway's Marine Oil Production, 1953-55

Year	Metric Tons
1955	71,000
1954	95,000
1953	58,000

It is anticipated that the total production of fish oil in Norway for the year 1956 will be approximately 100,000 metric tons. The refiners of oils in Norway have made an agreement with the fish-reduction factories to purchase the entire production so that there will probably be no exports of crude fish oil for the year 1956. All of the oil produced to date has been sold. Norway has some bilateral agreements with countries behind the Iron Curtain for the delivery of processed fish oils and refined hydrogenated fish oil will be exported to cover these commitments.

Table 2 - Norway's Crude Herring Oil Exports by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
United States	283.1	260.4
Poland	350.7	519.8
Czechoslovakia	2,314.0	1,089.9
Spain	353.4	0.0
Italy	146.9	112.6
Western Germany	104.6	1,688.9
Belgium & Luxembourg	280.5	216.9
Denmark	0.0	1,096.3
France	289.8	26.5
Netherlands	194.1	1,277.6
All Others	554.3	418.3
Total	4,871.4	6,707.2

Table 3 - Norway's Crude Seal Oil Exports by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
Spain	0.0	157.4
Italy	547.0	831.1
Western Germany	2,887.2	1,930.0
Denmark	1,032.2	1,346.7
France	414.4	236.7
Netherlands	10.0	1,163.8
United Kingdom	100.0	0.0
Brazil	0.0	165.5
All Others	26.5	166.3
Total	5,117.3	5,997.5

There is very little of the fish oil used in Norway for industrial purposes. One firm operates a Solexol plant, but this is used principally for the production of a grade of oil from the poorer grades of oils (both domestic and imported) that will refine and bleach in a satisfactory manner for edible purposes. The other fraction of the oil is used in the production of synthetic resins of the alkyd type under Reicholt license. This company handles the largest production of finished products in Norway.

The other Norwegian refiners of fish oil buy lower grade fish oils from Angola, Portugal, Morocco, etc. at cheap prices and treat them by special refining methods before mixing them with Norwegian herring oil for hydrogenation.

Table 4 - Norway's Edible & Inedible Polymerized & Refined Marine-Animal Oil Exports by Destination, 1954-55

Type & Destination	1955	1954
	(Metric Tons)	
Edible:		
Finland	23.5	30.8
Sweden	63.3	173.0
Western Germany	518.2	282.1
Peru	23.8	9.9
Denmark	0.0	80.0
All others	0.0	67.9
Total edible	628.8	643.7
Inedible:		
France	0.0	20.0
Netherlands	0.0	10.4
Egypt	2.0	0.0
Total inedible	2.0	30.4

Table 5 - Norway's Sulphonated Marine-Animal Oil Exports by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
Finland	109.5	142.0
Sweden	34.2	37.9
Denmark	21.7	25.6
Netherlands	2.8	10.0
All others	41.1	19.0
Total	209.3	234.5

On account of the monetary situation in Norway, it is desirable that Norway exist as much as possible on its own production of fats and oils, using its surplus of fish oil for trading purposes with other countries. The type of oil used for industrial purposes consists principally of seal oil, used in the leather industry, as well as being treated to produce suitable textile oil, etc.

Table 6 - Norway's Exports of Fatty Acids from Marine-Animal Oils by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
Finland	366.2	349.6
Poland	0.0	498.3
Spain	351.2	800.7
Sweden	881.9	868.8
Western Germany	411.6	2,508.4
France	426.5	239.4
Belgium & Luxembourg	113.1	142.1
Netherlands	169.2	30.6
United Kingdom	75.4	135.1
Austria	28.7	202.3
Eastern Germany	84.0	155.0
Denmark	19.4	125.8
All others	171.9	533.8
Total	3,099.1	6,589.9

Table 7 - Norway's Exports of Hardened Edible Fat & Technical Fat from Marine Oils, 1954-55

	1955	1954
	(Metric Tons)	
Edible Fat Total	66,446.8	70,896.7
Technical Fat Total.	7,044.2	4,883.1

Statistics in Norway except for production and imports and exports of crude fish and whale oils are not very easy to obtain. Those issued officially by the Government covering the refined, hydrogenated and other manufactured products are lumped in categories which include vegetable and animal fats and oils. Due to cheap electric power in Norway, the cost of producing hydrogen is quite low and the hydrogenation of fats and oils is very well developed.

As is the case in Sweden, combinations of whale oil and fish oil in varying proportions are refined and hydrogenated for the manufacture of margarine and usually sold on a specification basis under a particular trade name.

The polymerization of fish oil in the manufacture of edible liquid fish oil was originally started in Norway and a very large production was built up. Since the prohibition of the use of polymerized fish oil in Germany for edible purposes, this business has dwindled greatly and we were informed that it now consists of only a few hundred tons a year compared with thousands of tons in past years. The use of refined fish oil in fish canning has been nearly all replaced by edible vegetable oils. There are still one or two small canners who use fish oil since they feel that if there is some reversion to the original fish flavor it will not be noticeable in the finished canned fish.

The price of fish oil usually is kept below that of whale oil and though it may vary during the year, unless there is some special circumstance, it must remain lower than whale oil because the cost of refining and hydrogenation is greater than in the case of whale oil with which it competes.

Table 8 - Norway's Exports of Cold-Cleared Cod-Liver Oil by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
Finland	110.2	133.3
Yugoslavia	132.5	83.5
Czechoslovakia	393.0	429.5
Greece	105.2	137.1
Italy	223.2	248.0
Switzerland	121.6	111.5
Western Germany	209.4	285.7
France	108.6	112.4
Netherlands	655.5	760.0
Other Eur. Countries	508.1	463.4
Canada	221.4	145.9
United States	1,348.9	938.3
Brazil	214.5	307.9
Indonesia	162.7	59.0
All others	674.8	792.1
Total	5,189.6	4,986.6

Table 9 - Norway's Exports of Veterinary Fish-Liver Oil by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
Finland	291.5	277.8
Italy	637.6	600.2
Switzerland	300.5	471.9
Sweden	912.2	1,193.6
Belgium & Luxembourg	120.4	166.1
Denmark	1,098.7	1,736.5
Netherlands	558.7	710.7
Other European Countries	336.9	629.9
Mexico	133.6	134.1
Brazil	52.6	178.2
All others	343.6	430.9
Total	4,786.3	6,529.9

Interest was expressed in the type of fish oil that is produced in the United States and shipped from Gulf ports. The Norwegians indicate that this oil has in their experience a lower iodine value and can be refined and hydrogenated to produce a product comparable to their refined hydrogenated herring oil. There was no tobis (sand eel) oil produced in Norway.

Table 10 - Norway's Exports of Other Fish-Liver Oils by Destination, 1954-55

Destination	1955	1954
	(Metric Tons)	
United States	428.4	421.1
Italy	471.8	218.2
Sweden	199.5	446.9
Western Germany	1,375.5	886.8
Austria	144.5	180.4
Belgium & Luxembourg	80.0	80.5
Denmark	36.5	255.4
France	633.9	402.8
Netherlands	351.8	486.1
United Kingdom	121.5	847.0
Other European Countries	743.9	1,072.6
Mexico	257.3	258.5
Brazil	116.0	414.9
All others	96.2	324.2
Total	5,056.8	6,295.4

There have been very large investments in fish-reduction factories as well as additional vessels for fishing for herring for these factories in the past two or three years. The Government has assisted by grants and loans in this program.

Unlike Denmark and the Netherlands, Norway fishes for herring on the Norwegian coast starting at the north and fishing down the west coast as the herring move south. The bulk of the herring is caught in the first six months of the year and it is interesting to note that in spite of the large amount of herring used for food in Norway, between 80 and 90 percent of the various types of herring caught go to the fish-reduction plants. It appears that there are three distinct kinds of herring caught on the Norwegian coast, including the so-called "winter herring" which does not have too high an oil content, the "fat herring" which comes later in the year after the fish have had better food, and the "small herring" which is young and soft and is not usually suitable to any great extent for food.

It is significant that in Norway, fish oil is looked upon as a very important edible fat or oil while we in the United States look upon our fish oils as being principally suited for industrial uses. It is probable that because there are only very small quantities of vegetable-oil seeds raised in Western Europe and requirements must be filled through importation of fats and oils or oil seeds from other countries that research on fish oil has been conducted and refining and hydrogenation methods developed that are particularly adapted to these peculiar oils.

It is the consensus that there are only about 30,000 tons of whale oil unsold and since all of the Norwegian crude fish oil is committed, the market will be stable for the balance of the year.

This is one of eight reports on a survey undertaken by the U.S. Fish and Wildlife Service for United States-produced oil with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 66, 70, 71, 87, 96, & 99 of this issue.

Peru

CANNED BONITO EXPORTS THROUGH APRIL 1956: Production of canned bonito in Peru for the season, which ends usually in April, amounted to between 1.4 and 1.5 million cases, according to a July 23, 1956 dispatch from the United States Embassy at Lima. It was expected earlier in the season that the canned bonito production would break all previous records, but due to a labor controversy with the fishermen during the height of the season, this prediction was not realized. On the basis of the early prospects several exporters oversold and had difficulty meeting their commitments.

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SWORDFISH BASE PRICE FOR EXPORT DUTY PURPOSES: The base cost price of frozen swordfish for purposes of export tax assessment was fixed at 8,240 soles (US$433.68) a short ton pursuant to a Supreme Resolution of February 7, 1955, to remain in force until April 1956, when the local authorities were to revise it. Pursuant to a Ministerial Resolution of May 28, 1956, the effective date of the base price indicated has been extended to December 31, 1956, according to a United States Embassy dispatch July 9 from Lima.

Broadbill Swordfish (Xiphias gladius).

Note: See Commercial Fisheries Review, July 1956, p. 86.

Correction: In that issue the US$ equivalent for 8,240 soles was shown as US$33.68 when it should have been US$433.68.

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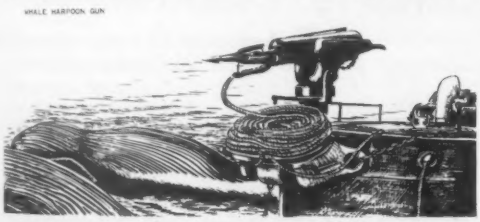
NEW WHALING FIRM TO HUNT IN SOUTH PACIFIC: The Peruvian press carried an article on July 6 stating that the first whaling fleet organized in Peru for the pelagic hunting of whales was expected to arrive in Talara toward the end of July. It was reported that the fleet was coming from French and Norwegian ports and that it would be comprised of the factoryship Janina of 9,200 tons and eight Norwegian hunting boats of 258 to 300 tons each, manned by Norwegian harpooners.



According to the press, the fleet has been chartered, with an option to purchase, by the Peruvian company to which the permanent Commission of the South Pacific has given a permit to hunt 2,400 sperm whales in the maritime zones of Chile, Ecuador, and Peru (CEP countries) between July 1, 1956, and June 30, 1957 Some of the vessels in the fleet are reported to have been transferred to the Peruvian company by their former owner. It is said that the firm that owns the vessels had initially applied for a permit to the Commission but had withdrawn its application explaining that it would charter or sell some of its vessels to the Peruvian company and in addition would guarantee the payment of the charges which companies obtaining whaling permits must remit in conformity with the regulations established by the

CEP countries. The charges have been fixed at $5,000 for the Peruvian company, which is a reorganization of the company which was not able to implement its plans to assemble a whaling fleet in 1955.

A later dispatch, dated July 23, from the United States Embassy states that as of this date, the Peruvian Company (Mancora Maritima, S.A.) organized to exploit the permit granted by the Permanent Commission of The South Pacific (Chile, Ecuador, and Peru) is still without a whaling fleet.

Poland

STATUS OF THE FISHERIES, 1954: Poland's landings of fishery products rose from 59,300 metric tons in 1949 to 89,400 tons in 1953 and 100,000 tons in 1954. Cod and herring were the principal species landed.

Table 1 - Poland's Landings of Fishery Products, 1949, 1953, and 1954

Species	1954	1953	1949
	...(Metric Tons)....		
Cod	49,500	47,300	36,900
Herring	38,900	33,700	12,000
Sprat	3,200	2,200	1,100
Other.....	8,400	6,200	9,300
Total	100,000	89,400	59,300

Source: Polish Statistical Yearbook 1955.

Production of smoked fish in 1954 amounted to 11,416 tons as compared to 9,225 tons in 1953. Canned fish production rose from 4,537 tons in 1953 to 5,236 tons in 1954.

Most of Poland's fishing is done in the Baltic chiefly by small vessels. Although the fishing industry has some trawlers about 150 feet long, larger vessels are being built in order to expand fishery production. From the North Sea mostly herring and some plaice are landed in Poland.

Portugal

FISHERIES TRENDS, MARCH-APRIL 1956: Sardine Fishing: The catch of the Portuguese sardine fleet amounted to only 12 metric tons in March 1956 and 423 tons in April. The April 1956 catch was 68 percent below the 1,337 tons reported for April 1955. The April 1956 sardine catch was valued at about US$101,670 ex-vessel as compared with US$171,583 in April 1955. The ex-vessel value of the sardine catch in April was close to 10.9 U.S. cents a pound as compared with 5.8 U.S. cents in April 1955.

During April 1956, the sardine canning industry absorbed only 44 tons with most of the balance consumed fresh. The small March sardine catch was used entirely by the fresh fish trade.

The catch of the Portuguese sardine fleet amounted to only 978 metric tons in January 1956, or about 83 percent less than the January 1955 catch. The January 1956 sardine catch was valued at about US$191,000 ex-vessel as compared with US$402,000 in January 1955.

The sardine canning industry in that month absorbed 739 tons with most of the balance consumed fresh or salted.

Other Fish: The landings of fish other than sardines (95 percent chinchards) for the two months totaled 889 tons, valued at US$136,504 ex-vessel, the June 1956 Conservas de Peixe reports.

The landings of fish other than sardines (practically all chinchards) in January 1956 totaled 4,888 tons, valued at US$208,000 ex-vessel.

* * * * *

CANNED FISH EXPORTS, JANUARY-APRIL 1956: Portuguese canned fish exports total 12,930 metric tons (680,000 cases) valued at US$7.2 million during January-April 1956.

Portugal's exports of canned fish in March 1956 declined 18 percent in quantity and 7 percent in value when compared with March 1955. April 1956 exports dropped

Portuguese Canned Fish Exports, January-April 1956

Species	January		February		March		April		Jan.-Apr.	
	Metric Tons	1,000 US$	Metric Tons	1,000 US$	Metric Tons	1,000 US$	Metric Tons	1,000 US$	Metric Tons	1,000 US$
Sardines in olive oil	2,317	1,158	2,889	1,524	2,692	1,424	1,867	993	9,765	5,099
Sardinelike fish in olive oil	142	127	349	288	611	538	439	368	1,541	1,324
Sardines & sardine-like fish in brine	99	22	249	45	155	29	50	10	553	106
Tuna & tunalike in olive oil	51	37	92	68	129	113	58	46	329	265
Tuna & tunalike in brine	4	2	28	17	51	27	13	7	96	53
Mackerel in olive oil	37	24	126	77	146	85	142	88	451	273
Other fish	25	12	77	25	55	30	38	20	195	84
Total	2,675	1,382	3,810	2,044	3,839	2,246	2,607	1,532	12,930	7,204

52 percent in quantity and 46 percent in value as compared with April 1955, according to Conservas de Peixe, June 1956.

During January-April 1956 Germany was the leading receiver with US$1,252,000 of canned fish (practically all sardines in oil), followed by the United States with US$1,163,000 (principally 585 tons of sardines and 769 tons of anchovies), Italy with US$837,000 (principally sardines and tuna), and Great Britain with US$772,000 (principally sardines). Exports of canned fish to these 4 countries during January-April comprised 53 percent of the quantity and 56 percent of the value of the total canned fish exports.

Portugal's exports of canned fish in January 1956 declined 52 percent when compared with January 1955, but exports in February 1956 were higher by 32 percent than for February 1955, according to Conservas de Peixe, May 1956.

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Portuguese Canned Fish Pack, Jan.-Feb. 1956

Product	Net Weight	Canner's Value
	Metric Tons	1,000 US$
Sardines in brine	-	-
Sardines in olive oil or sauce	526	318
Sardinelike fish in brine	9	3
Sardinelike fish in oil	552	553
Anchovies, rolled & fillets	-	-
Tuna in brine	-	-
Tuna in olive oil	31	33
Tunalike fish in olive oil	-	-
Other species (including shellfish)	52	17
Total	1,170	924

Note: Values converted to US$ equivalent on the basis of 28.75 escudos equal US$1.

CANNED FISH PACK, JANUARY-FEBRUARY 1956: The pack of canned sardines in oil or sauce for January-February 1956 amounted to 526 metric tons (net weight). The February pack was only 6 tons, and the January 1956 pack was 73 percent below the 1,912 tons packed in January 1955.

Spain

FISHERIES TRENDS, JUNE 1956: Fishing: June marked the beginning of the albacore (Germo alalunga) season in the Vigo area of Spain. The Vigo albacore (known locally as "bonito") fleet was delayed by bad weather and the first boats departed around June 20. Prospects are excellent for an above-normal albacore season, according to the United States Consulate at Vigo (July 10). Catches of other fish were considerably lower than the previous year and the sardine catches seem to be definitely on the decline. The weather was poor for fishing.

Canning: The fish canning industry in the Vigo area was practically inactive during June due mainly to the lack of species appropriate for canning. It is reported that the canneries purchased only 98,000 pounds of fish during June as compared with 288,000 pounds during the previous month and 1,455,000 pounds in June 1955.

The canneries were expected to be operating at a high level in July since albacore catches are known to be good. Albacore is one of the principal products of the canneries in the Vigo area.

For the present, the canneries have an adequate supply of tin plate and olive oil. However, prices paid for olive oil are considered high. The canneries are concerned over the tin-plate situation, but it is believed in some circles that the Spanish authorities will endeavor to see that their needs are met.

Spanish Morocco

STATUS OF THE FISHERIES, 1955: Fishing continued to be an important industry in the Spanish Zone of Morocco with an estimated catch in 1955 in excess of the previous two years (see table). Only a minute portion of the estimated 10 million tons of yellowtail tuna which enter the Mediterranean each year to spawn were

Spanish Morocco (Including Ceuta and Melilla) Fishery Products Landings, 1953-55

Item	Quantity			Value					
	1955	1954	1953	1955		1954		1953	
	(Metric Tons)			1,000 Pesetas	US$ 1,000	1,000 Pesetas	US$ 1,000	1,000 Pesetas	US$ 1,000
Spanish Zone	12,512	10,419	10,814	36,491	1,201	25,092	826	28,592	941
Ceuta	n.a.	3,754	3,111	n.a.	n.a.	15,538	511	10,973	361
Melilla	7,592	5,794	6,311	25,500	839	16,883	555	18,996	625

caught, and these mostly in the Almadraba nets on the Atlantic coast which trap the schools as they approach Morocco from the southwest.

The output of the canneries remained high, but only one plant in Larache could meet the health requirements necessary to export its product to the United States, according to a June 25 United States consular dispatch from Tangier.

Sweden

MARINE OIL MARKET: Fish oil in Sweden is a comparatively minor item in the over-all fat and oil picture. There is virtually no local production of fish oil. During some seasons of the year when the herring visit the west coast of Sweden, a few are caught and some herring meal is made from the offal and surplus herring, but none of the oil is extracted separately.

Imports of fish oil into Sweden for the past three years have declined steadily.

Virtually all of the fish oil imported into Sweden is hardened after mixing with whale oil, and the mixture is used in the manufacture of table margarine. The technical director of the Margarine Cooperative of Sweden states that they use a mixture of hydrogenated whale oil and fish oil for about 20 percent of the fat content of their margarine. They buy the mixture already hardened but not refined or deodorized, preferring to do the refining and deodorization immediately preceding the

manufacture of the margarine so that the oil will be absolutely fresh. Sweden has one plant built during the last war engaged in the hydrogenation of fats and oils. Prior to that time the hardened whale oil and fish oil was imported from Norway.

The margarine users do not bother with the proportions of whale oil and fish oil in the material which they purchase and confine their specifications to the required melting-point, which varies from 32° C. to 38° C. (89.6° F. to 100.4° F.) depending on the seasons of the year, and also to a free fatty acid content of not over 0.5 percent.

Sweden's Imports of Fish Oil by Country of Origin, 1953-55

Country of Origin	Metric Tons
1955:	
Norway	1,010
Denmark	232
Iceland	287
Total 1955	1,607
1954:	
Norway	1,630
Denmark	229
Iceland	268
W. Germany	270
Total 1954	2,438
1953:	
Norway	1,457
Denmark	154
Iceland	100
Total 1953	1,829

In addition to the fish oil used in the manufacture of margarine, approximately 300-350 tons of liquid refined fish oil is used annually in the fish canning industry. This oil is usually purchased from Norway in the refined state and is not polymerized. Due to the unfavorable publicity given to polymerized oil, very few if any plants polymerize fish oil that is used for edible purposes. The margarine manufacturers use fish-liver oil in their margarine for the vitamin content and they usually purchase the better grades of cod-liver oil, standardizing this material for vitamin A and C content themselves. They buy the cod-liver oil directly from the fishing fleet which is engaged in the trade of fishing for cod.

So far as we were able to find out, no menhaden oil is imported into Sweden from the United States. However, in Hamburg one firm has shipped some American menhaden oil from Rotterdam under the name of herring oil. The particular lot of oil that was shipped originated in the Gulf, and had a lower iodine number than the oil from the Atlantic coast.

Exports of fish oil from Sweden are negligible and probably consist only of cod-liver oil. The maximum was 21 tons, which was exported to Norway in 1955. It is practically impossible to secure any reliable statistics for fish oil alone. In all cases they are combined, for official purposes, with whale oil, etc.

This is one of eight reports on a survey undertaken by the U.S. Fish and Wildlife Service of markets for United States-produced fish oils with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 66, 70, 71, 87, 90, & 99 of this issue.

Union of South Africa

FISHERIES TRENDS, MAY-JUNE 1956: Fishing in Union of South Africa waters in May and June this year has been disappointing and production of canned fish and fish meal consequently has been low. Overseas quotations for fish meal continue to decline while prices for fish oil remain firm. The demand for canned fish in the export market is said to have increased considerably with improvement in export prices. Canned and frozen rock lobster production in the Union has been satisfactory and stocks have been liquidated against firm overseas demand at profitable prices.

Reliable sources here report the discovery of breeding grounds just north of Walvis Bay of pilchards caught off the South-West African coast. These breeding grounds are said to cover an area of 800 square miles.

This discovery apparently was made by South African scientists aboard the 90-ton research vessel Namib II, a floating laboratory for the Department of Fisheries of South-West Africa. The captain of this vessel states that over a period of time he has collected spawn in silk plankton nets in this area, confirming the existence of pilchard breeding grounds, according to the United States Consulate at Cape Town (report dated July 11).

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SALDANHA BAY FISHERIES AT A LOW LEVEL: According to newspaper reports, the canning industry and the fishermen operating within a radius of 60-70 miles from Saldanha Bay Harbor in the Union of South Africa are experiencing the worst season in 20 years. The present scarcity of fish is comparable to that of 1933 which was considered to be the worst in the history of the industry, states a June 25 dispatch from the United States Consul at Cape Town.

The hardest hit are the hundreds of independent fishermen who operate from Saldanha. The newspaper reports: "as soon as there is a rumor that the fish are running the boats put out to sea in hopes of a profitable catch, but they return with hardly enough to meet fuel and running expenses. With hardly any money coming in because of the lack of fish, the independent fishermen are described by one cannery official 'just living on the breadline'."

Sporadic schools have yielded more than 300 tons in a recent two-day period, but this is considered poor compared with catches in previous years which have exceeded this amount fivefold.

The scarcity of fish has also caused financial losses to the canning industry in the area.

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FISH PUBLICITY CAMPAIGN LAUNCHED: Following the report of the Special Committee on Fish consumption, an advertising agency is to take the lead in a nation-wide publicity campaign to make South Africa more fish-minded.

The campaign was scheduled to begin early in July with large advertising spaces in the national press, bringing to the public the "Eat More Fish" message and pointing out the nutritional and economic benefits of fish as a major item in the daily diet. In addition, radio programs will be used.

An important part of this campaign will be directed towards the African and other non-European people through their own press. Hotels, cafes, clubs, and institutions will be persuaded to feature fish prominently on their menus.

The advertising campaign will be closely supported by many other forms of fish publicity, including intensive editorial publicity handled by a Cape Town firm of public relations consultants. The editorial publicity campaign has already been foreshadowed by a regular series of fish recipe articles in English and Afrikaans, which are now being published by newspapers and magazines all over the Union and in the Federation of Rhodesia and Nyasaland.

Several daily newspapers have agreed to run competitions for the best fish recipes sent in by readers, which will intensify the interest in fish cooking and bring the "Eat More Fish" message right into the home. Prizes for these competitions, which are to be run individually by the newspapers, are being put up by the advertising agency.

The Union's Department of Nutrition is cooperating closely with the advertising and public relations side of the campaign, and the cooperation of the Director of the Fishing Industry Research Institute, Cape Town, has already been enlisted for writing signed articles and broadcasts on the nutritional value of fish.

A valuable weapon in this campaign to make South Africans more fish-conscious will be the Deep Sea Fisheries Information and Publicity Centre, opened this month. Here it is planned to hold demonstrations of fish cooking, lectures, and film shows for women's organizations, domestic science teachers, and others.

Available at the Centre will be information on the trawling industry for schools, students, and journalists, and it will be open for inquiries on all aspects of fish cookery and fish preparation.

The Centre is in a spacious room equipped with a kitchen, and has been designed and furnished with the maximum of comfort by a Cape Town artist. From a model "Frikkie Bar" refreshments and fish snacks will be served at gatherings. A model shop window has been built into the room over which a cinema screen can be drawn for film shows. A wall newspaper is being organized so that visitors can be kept up to date with the latest developments in the campaign.

The trawling industry will in the future be represented at shows and exhibitions all over the country. Frikkie Fish Bars will be organized at charity and other shows.

A second book in the painting and story book series about the adventures of Frikkie and Seabell, the mermaid, is now in the press and will soon be available to the trade and the public. The second edition of the first book is now almost sold out. More than 75,000 copies have been distributed.

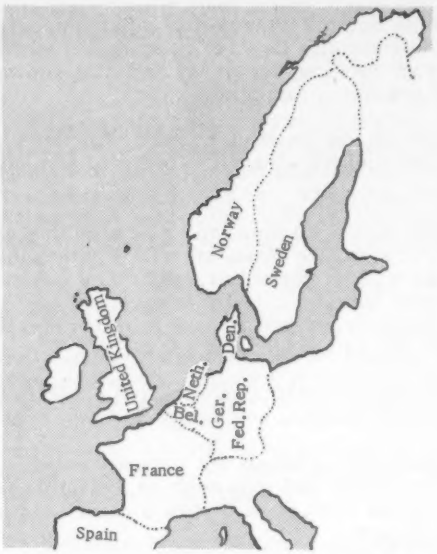
A comprehensive film in color on all aspects of the trawling industry is now being made and will later in the year be available for schools, institutions, clubs, and other organizations.

United Kingdom

MARINE OIL MARKET: Marine oils receive the greatest interest in the United Kingdom from the edible oil trade. No matter what the source of oil is (for edible purposes) it is used in the hydrogenated form. The principle marine oil used is whale oil. In addition to this, herring oil of local production is also used. The duty on herring oil into the United Kingdom is 10 percent ad valorem, and this practically precludes the importation of any fish oil. There is no duty on whale oil.

Whale Oil: The United Kingdom uses more whale oil than is produced by the whaling fleet operating under the British flag. Informal trade estimates of the total quantity of whale oil that will be available totals approximately 50,000 to 54,000 metric tons. In view of present rapid movements of prices and sudden changes in availability of other oils and fats, it is difficult to set out detailed figures. From the views expressed by a number of the leading buyers, however, the opinion exists that potential demand is greater than supply so that, provided sellers do not ask for prices out of line with those of other materials, the quantity of oil indicated should all move into consumers' hands easily and possibly quickly. Although it is not used for precisely the same purpose, whale oil to a very large degree determines the markets for fish oils generally. The same is not true of whale-meat meal, although prices of whale-meat meal do, in fact, move conformitively with those of fish meals.

Herring Oil: The herring oil and meal industry is operated by the Herring Industry Board which is a quasi-Government agency. This Board operates two reduction plants in Scotland; one at Aberdeen, and the other at Frazerbrook, which is 80 miles north of Aberdeen. The production of herring oil has varied somewhat in the last four or five years and definitely is not growing. All of the oil is sold to two companies in about equal proportions. Sales are made in advance of production and are subject to the oil being produced. If there is no production, then there will be no sales contract effective. The two principal companies who share the production of herring oil refine and hydrogenate herring oil, but it is not believed that in either case the oil is polymerized prior to hydrogenation. One of the companies is using the hydrogenated herring oil in the manufacture of their lower-grade margarine. The other firm is using the hydrogenated herring oil in the production of a lower grade of cooking fat or shortening which is distributed in the United Kingdom. Both companies are quite secretive regarding the use of this product and claim that it is only a minor portion of the total oils used for edible purposes.



Prices have been higher this year than last year for herring oil and the reason given is that whale oil as well as liquid vegetable oils have advanced in price, thus making the value of all fats and oils used for edible purposes advance somewhat, although not in the same proportion or amount as have soybean oil, cottonseed oil, peanut oil, etc.

British Herring Industry Production of Herring Oil and Meal, 1951-55

Year		Oil	Meal
		..(Metric Tons)..	
1955	.....	6,939	12,236
1954	.....	7,000	14,000
1953	.....	8,633	18,042
1952	.....	5,518	11,532
1951	.....	1,958	3,982

Pilchard Oil: There is imported into the United Kingdom between 10,000 and 15,000 tons of treated South African pilchard oil. This oil is of a high iodine value, made by the "Solexol" process. There is no duty on this oil, since it is used strictly for industrial purposes. Most of it is used as a drying-oil extender in the paint business, but some is also used in making cheaper grades of floor coverings. This oil must sell for at least 10 percent less than linseed oil in order for it to be attractive to the drying-oil users.

This is one of eight reports on a survey undertaken by the U. S. Fish and Wildlife Service of the markets for United States-produced fish oils with emphasis on Western Europe.

Note: See Commercial Fisheries Review, August 1956, p. 47; also see pp. 58, 66, 70, 71, 87, 90, & 96 of this issue.

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IMPORT QUOTA FOR CANNED SALMON FROM NORTH AMERICA AND SOVIET RUSSIA: British import quotas for canned salmon from North America for the year ending June 30, 1957, are the same as for the preceding year, but there was a reduction of US$616,000 in the import quota from Soviet Russia, the British Board of Trade reported in a release dated July 17, 1956.

The notice to importers No. 788, July 18, 1956, is as follows:

"Notices to Importers Nos. 739, 744, dated July 9, 1955 and August 6, 1955 respectively, announced arrangements for the import of canned salmon from North America and the Union of Soviet Socialist Republics during the year ending June 30, 1956. The Board of Trade now announce that further quotas have been arranged for the import of canned salmon originating in and consigned from those sources during the year ending June 30, 1957.

"The quotas are as follows:

"From North America £3 million (US$8,400,000) f.o.b. (£3.3 million--US$9,240,000--c.i.f.)

"From U.S.S.R. £ 1 million (US$2,800,000) f.o.b. (£1.1 million--US$3,080,000--c.i.f.)

"The British Board of Trade also stated that imports from Japan would be expected to continue in 1956/57 and a further quota for Japan will be fixed in the fall. The imports of canned salmon from Japan in 1955/56 were valued at US$13,160,000 (United States Embassy in London, dispatch dated July 19).

* * * * *

CAMPAIGN TO SELL MORE FISH TO THE HOUSEWIFE: There has already been a good response from retailers to the new British advertising campaign launched by the White Fish Authority (W.F.A.) early in June, points out The Fishing News (June 15), a British fishery periodical.

The campaign, on which the W.F.A. is to spend US$280,000 in 1956-57, aims at focusing the housewife's attention on the men who serve her at the fishmonger and in the fried fish shop. This approach dovetails with the direct advertising of fish sponsored by other interests in the industry.

Apart from national advertising which puts into the mouth of "Our Fishmonger" or "The Man in our Fried Fish Shop" words pointing to one or another particular value of fish, there are ideas and blocks for local newspaper advertising in which retailers can insert their own names.

The "Whispering Fish" promotion scheme continues and includes leaflets and fish recipes.

The W.F.A. is planning to back up their advertising campaign with an advisory scheme for the fishmongers and friers to help them to sell more fish when the advertisements have drawn the housewife to their shops.

Although the campaign is concentrated at the retail stage, its benefits will be reflected in all sections of the industry as it helps to increase the housewife's demand for fish.

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CODE OF PRACTICE FOR FREEZING FISH: A Code of Practice for freezing fish was issued by the British White Fish Authority on June 1956. The new code supersedes one issued in July 1953 and provides:

1. Quick frozen fish in relation to white fish means fish which has been
   (a) frozen by process which reduces the temperature of the whole of the fish from 32° F. to 23° F. or lower in not more than two hours; and
   (b) kept in the freezer until the temperature has been reduced to minus 5° F. or lower.
2. Fish which has not been so frozen should not be described or offered for sale as "Quick Frozen."
3. Fish for quick freezing should be of such quality as could reasonably be expected after storage and transport to provide good, wholesome food when thawed.
4. Fish should be adequately iced whilst awaiting processing and should be frozen with the minimum delay.
5. An officer authorized by the Authority shall at any reasonable time be given facilities at the quayside or at the premises of the processor for the examination of all fish intended for quick freezing, in order that he may ascertain whether its quality and the conditions under which it is handled, processed, frozen and stored are satisfactory and conform in all respects to this Code.
6. The wrapper or container of quick frozen fish packed for sale either by wholesale or retail should either enclose a slip of paper carrying a code mark, or itself be marked with a code mark. If fish is quick frozen without a wrapper, a slip of paper carrying the code mark should accompany the fish. The code mark should enable the processor to be identified, and his records of code marks should be such as to enable him to detail particulars of purchase, freezing and storage.
7. The weight of consumer packs is subject to legislation. For all other packages, the net weight at the time of packing before freezing should not be less than the weight at which the package is purported to be sold.
8. Immediately after freezing, all quick-frozen fish should be placed in cold storage at a temperature not higher than minus 5° F., or at a lower temperature where possible. A pipe-cooled store should be preferred.
9. A steady temperature should be maintained in the cold store; the following points should be observed:
   (a) All cold stores should be fitted with an air-lock.
   (b) The quick-frozen fish should be as near as possible to the temperature of the cold store at the time of storage.
   (c) Quick frozen fish should be kept from direct contact with the floor, walls, ceilings, and cooling pipes of the store by the use of racks, battens, and similar devices.
   (d) Where quick frozen fish is passed into a cold store by conveyor belts, the opening for the belt should be as near the roof of the store as practicable.
   (e) The opening of doors should be reduced to a minimum and they should not be left open.
   (f) Freezing and storing should not be carried out in the same chamber at the same time.
   (g) Where the store is controlled thermostatically, the controlling mechanism should be adjusted so that there is only a narrow variation between stopping and starting temperatures.
10. All quick frozen fish should be tightly wrapped in a water-vapour proof material or should be glazed. Double glazing is desirable.
11. Quick frozen fish which has been glazed should, if kept in cold storage for several months, be regularly examined and re-glazed when necessary.
12. All quick frozen fish stored should be regularly examined to ensure that it has been satisfactorily preserved during cold storage.
13. All consumer packs and any type of quick frozen fish intended for subsequent storage should be transported in pre-cooled insulated containers.

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SCOTTISH HERRING FISHERIES PROSPECTS FORECAST ANNUALLY: Prospects are good for Scottish herring fisheries in the North Sea during this year, and a good stock of herring is expected both on the Shetland grounds and off the north-east coast of Scotland. This is the encouraging prediction made by the Marine Laboratory at Torry, Aberdeen, Scotland in its annual forecast for the fisheries, published in the current issue of the "Scottish Fisheries Bulletin."

The forecast is compiled from extensive data on the distribution, abundance, movements, and availability of herring stocks in the fishing areas,

In a review of the forecast for 1955, the Bulletin says that the results of the fisheries that year were in general agreement with the forecast, and in all of them the average landings were maintained at a high level.

It is revealed that in the Northeast Coast fishery the catches of the two-year-old age group in 1954 and 1955 were larger than in any other year on record, and the young herring have increased in size.

In making their forecast for this year the Torry scientists point out that general biological events in recent years have caused striking changes in the abundance and composition of the fishable stocks and in the productivity of the fisheries.

"Reservation must also be made for the possible effects of other factors which may have a marked influence on the resources of the fisheries--weather conditions during the fishing season; size and searching power of the fishing fleets. The predictions are made on the assumption that the searching power of the fleets and the general conditions (weather, etc.) affecting their operation are generally favorable."

The forecast also includes details by fishing area and prospects for the early and later herring fishing which takes place in some areas, according to a report which appeared in the July 13 issue of the British periodical The Fishing News.

FISHERY PRODUCTS--GREAT PROFIT POTENTIAL FOR RETAILERS

One of the greatest profit potentials for the food retailer yet to be exploited is fishery products, Frank W. Wilkisson, New York, N. Y., stated on April 18, 1956, upon assuming the presidency of the National Fisheries Institute, national trade association of the fishing industry, which held its Eleventh Annual Convention at Miami Beach, Fla.

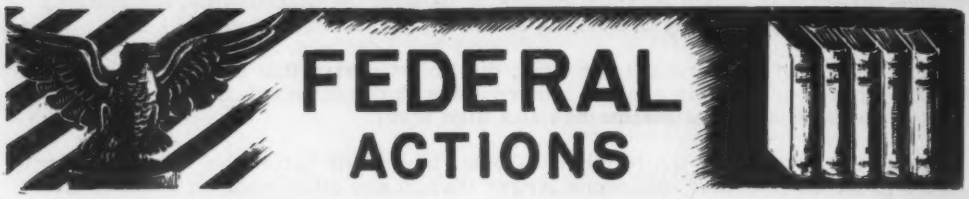
Wilkisson stated that food retailers can use fishery products, with all their varieties and glamorous appeal, as a traffic builder for their stores.

"The retailer can make big money on fisheries products," said Wilkisson. "In fact, I don't know of a single food retailer who has not made increased profits when he has given space and attention to fish products. All he has to do is to use fish and seafoods as a leader to create store traffic; give space enough to such products to permit good display and promote to the consumer the fact that he has such attractive foods.

"The retail trade has hardly begun to exploit fish products for profits as it can and should," continued Wilkisson. "They are one of the few as yet not fully-exploited lines of products on the retailer's shelves and in his freezers. This is true of fresh fish and seafoods the same as frozen. The next few years will see great strides in this field and the retailer who capitalizes on our products now is certain to build customers for his whole retail outlet."

"An indication of the high-profit rating of fish products is shown by a study by Progressive Grocer of selected supermarkets in Cleveland. Profits of meat products over a 13-week period averaged 16.9 percent; dairy products, 15.5 percent; and all frozen food products, 22.2 percent. On the other hand, margins on cooked frozen seafoods ran to 42.4 percent and uncooked, 29 percent, showing that profit margins on fish products run considerably higher than other foods."

--Excerpt from address at National Fisheries Institute Eleventh Annual Convention, April 18, 1956.



Federal Trade Commission

WEST COAST TUNA INDUSTRY CHARGED WITH PRICE FIXING:

The Federal Trade Commission on September 12, 1956 (Docket No. 6623, Tuna) charged that virtually all of the tuna industry on the West Coast is engaged in a conspiracy to fix tuna prices and to prevent competition in this industry.

The West Coast accounts for more than 90 percent of the Nation's tuna pack, which has an annual wholesale value of $200 million. Cited are an assocation of canners and its membership; three area unions, affiliates of either the A.F. of L. or the International Longshoremen & Warehousemen's Union; and several associations of tuna boat owners.

Charging violation of Sec. 5 of the FTC Act, the complaint alleges that the boat owners' associations each year in an unauthorized manner negotiate with the canners to fix the prices paid to their members for raw tuna. The Unions, the complaint continues, then enter into working agreements with the boat owners on the basis of the illegally-fixed prices, with the Unions retaining the right to approve or disapprove such prices. The complaint charges that the respondents use their power and influence to see that these prices are maintained.

The canners are separately charged with conspiring among themselves to maintain fixed prices which they charge for canned and frozen tuna and to suppress competition among themselves and with others. Some of the canners and boat owners are charged further with conspiring to prevent competition from the Japanese tuna industry.

The result of these activities, the complaint charges, is to hinder catching tuna in Pacific waters and in Japan and to restrain competition in the purchase of raw, canned, and frozen tuna. The ultimate result of the conspiracies, the complaint states, is that the public must pay more for tuna.

According to the complaint, the boat owner associations ostensibly were organized as cooperative marketing associations but, in effect, serve principally to fix noncompetitive prices.

The dominant association of boat owners is charged with committing coercive acts to maintain these prices. For example, vessels are not permitted to fish for any canner who does not agree to pay the fixed prices. In other instances, vessel owners are not allowed to fish until they agree to sell a canner designated by the association.

Members of the Unions, according to the complaint, refuse to fish for tuna until they have approved the agreed prices. Some do not fish on any boat whose owner has not agreed to abide by the fixed prices.

The Unions also are charged with operating patrol boats, in cooperation with some of the boat owners, to police the San Pedro and San Diego tuna fishing areas to assure that the agreed prices are adhered to as well as union rules and regulations. The patrol boats also prevent boat owners and fishermen who do not belong to an association or a union from selling their fish unless they agree to the prices. All must pay an assessment for maintenance of the patrol, the complaint adds.

All parties are charged with attempting to limit the length of time in a season during which tuna may be caught.

The complaint then lists these charges: Since about 1952 the canners, particular-

ly the three largest canners, who jointly account for 70 percent of the tuna pack, have conspired jointly with the dominant association of boat owners to restrict free competition at their level of the industry. For example, they have agreed, to some extent, on fixed prices, discounts, and terms of sale of canned and frozen tuna. They also have acted to require all to adopt uniform cost-accounting systems. They have exchanged weekly confidential reports showing their individual purchases, sales, and inventories. They have acted to prevent canners from selling on a consignment basis and to assure that no member canner acquires excessive stocks of canned tuna. The canners, the members of the association, and the San Diego Union are charged with suppressing competition from the Japanese tuna industry.

According to the complaint, these respondents have: (1) curtailed the volume of Japanese canned tuna exported to the United States and raised the prices of this commodity; (2) controlled the volume of Japanese imports of fresh frozen tuna and raised the prices of this commodity; (3) suppressed exports of Japanese tuna discs; and (4) sent a Tuna Plan Committee to Japan for the purpose of effectuating their conspiracy.

The complaint notes that among the tuna exported by Japan to the United States are frozen precooked can-shaped pieces of tuna known as "tuna discs." The American importer adds liquid to this commodity, lids the can, and completes the cooking process. Most of the importers engaged in this business are East Coast competitors of these respondents. The complaint charges that the respondents have attempted to cut off the source of supply to these competing canners.

Finally, two of the largest canners are charged with controlling the summer markets for fresh and frozen albacore tuna in both California and Japan by raising and then depressing the prices of albacore tuna in these areas.

The business of canning tuna is conducted principally in California and supports over 100,000 people on the West Coast alone. There are various species of tuna: albacore, yellowfin, skipjack, bluefin, bonito, and yellowtail.

There are three types of fishing vessels used in fishing for tuna. The principal fleet is comprised of tuna clippers, large boats capable of extended voyages and equipped for prompt freezing of tuna. The clipper fleet, which is stationed in San Diego, accounts for approximately 70 percent of all the tuna caught in the United States. An association represents the great majority of this fleet.

The second most important fleet is comprised of purse seiners, smaller vessels fishing off the Pacific Coast. This fleet operates principally out of San Pedro, and its catch accounts for about 17 percent of the total. This fleet is also represented by an association.

The third fleet is comprised of approximately 3,500 small vessels referred to as "albacore boats." This fleet accounts for about 13 percent of the total tuna catch. It also is represented by an association.

The boats deliver the tuna directly to the canners who clean, cook, and fillet them into varying grades of tuna. The bulk of the total pack is canned in 7-ounce and $6\frac{1}{2}$-ounce cans and shipped in cases of 48 cans each. The grades of tuna are: fancy, standard, grated or shredded, and tuna flakes.

A tuna clipper unloading at San Diego. Water in trough carries fish to weighing shed and then to bins outside cannery.

According to the complaint, the dominant association has been entering into written price-fixing agreements with the canners

since January of 1953. Negotiations are carried on for several months, and when the princes are finally agreed upon, they become the established prices for the entire tuna industry on the Pacificic Coast.

During these negotiations the dominant association of boat owners keeps in contact with the San Diego Union, which has the right, by member vote, to accept or reject the prices. Since 1952 the Union has accepted the prices, but it is tacitly understood, the complaint says, that if the prices are not acceptable, the union members will refuse to fish for tuna until there is an adjustment.

(It is common in the industry for union members to be paid for fishing on a share basis with the boat owners rather than by a fixed salary or wage.)

The parties are granted 30 days in which to file answer to the complaint. A hearing was scheduled November 19 in Long Beach, Calif., before an FTC hearing examiner.

Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION:

CANNED TUNA IDENTITY AND FILL-OF-CONTAINER STANDARD PROPOSED: A proposed standard for identity and fill-of-container for canned tuna was announced by the Food and Drug Administration. Full text of the standard, which was proposed in a petition filed by the National Canners Association and 21 tuna packers, was published in the Federal Register of August 28.

The standard would designate the various species of fish which may be called tuna. In addition to the true tunas, custom has long sanctioned use of the term "tuna" as applied to canned skipjack. The standard recognizes this practice, and adds to the list of tunas "kawakawa" or bonito, Euthynnus yaito, a species taken in the Pacific and canned in the Hawaiian Islands.

The standard would define the styles of pack and require uniform names for these, namely "Solid" or "Solid Pack," "Chunks" or "Chunk Style," "Flakes," and "Grated." These names are now in general use.

The standard would require an accurate labeling statement as to the color of the tuna. Light-colored tuna is generally considered more desirable and there has been some consumer complaint in the past because rather dark tuna was

Test canning little tuna at a U. S. Fish and Wildlife Service Technological Laboratory. Removing pack from retort after processing.

labeled as "Light." The standard provides for differentiating between the shades of color by use of a special optical instrument so that there need be no reliance on opinion as to the color. Under the standard tuna would be labeled as "White," "Light," "Dark," "Blended Light and Dark," or "Blended Dark and Light."

The name of the packing medium would be required to be shown on the label. The permitted liquids are vegetable oils, olive oil, and water. The standard would also permit optional use of seasoning ingredients with appropriate label declaration.

A proposed standard of fill would require cans of tuna to be filled as full of fish as has been found practicable. Compliance with this requirement would be determined by removing the contents of a can, pressing out the oil and watery juice, and weighing the press cake consisting of cooked fish of relatively uniform composition.

Thirty days is allowed for filing written comments on the proposed standard.

In the event the standard is adopted, it would be the first mandatory Federal standard for canned tuna. If adopted, canned tuna not meeting any standard adopted would be banned from shipment in interstate commerce.

The full text of the proposed standard as published in the Federal Register follows:

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Food and Drug Administration

[21 CFR Part 37]

CANNED TUNA FISH

NOTICE OF PROPOSALS TO ADOPT DEFINITION AND STANDARD OF IDENTITY AND STANDARD OF FILL OF CONTAINER

Notice is hereby given that a petition has been filed by National Canners Association, 1133 Twentieth Street NW., Washington, D. C., and the following canners of tuna fish: Barbey Packing Corporation, F. E. Booth Company, Inc., California Marine Curing and Packing Company, Columbia River Packers Association, Inc., Crown Packers, Inc., Farwest Fishermen, Inc., Franco-Italian Packing Company, Inc., Hawaiian Tuna Packers Ltd., High Seas Tuna Packing Company, Inc., Pan-Pacific Fisheries, Inc., Point Adams Packing Company, Portland Fish Company, Seattle Seafoods, Inc., South Coast Fisheries, Inc., Star-Kist Foods, Inc., Union Fishermen's Co-Operative Packing Company, Van Camp Sea Food Company, Inc., Washington Packing Corporation, West Coast Fish Company, Inc., Westgate-California Tuna Packing Company, Whiz Fish Products Company.

The petition sets forth proposals to adopt a definition and standard of identity and a standard of fill of container for canned tuna. The proposals are set forth below.

Notice is also given that supplementary petitions have been filed by Hawaiian Tuna Packers Limited, 215 Market Street, San Francisco 8, California, and by the California Fish Canners Association, Inc., Ferry Building, Terminal Island, California, each proposing certain additional provisions to be added to the definition and standard of identity for canned tuna proposed by the National Canners Association. The proposals contained in these supplementary petitions are also set forth below.

Pursuant to the authority of the Federal Food, Drug, and Cosmetic Act (sec. 401, 701, 52 Stat. 1046; Pub. Law 905, 84 Cong., 2d Sess.; 21 U. S. C. 341, 371) and delegated to him by the Secretary of Health, Education, and Welfare (20 F. R. 1996), the Commissioner of Food and Drugs invites all interested persons to present their views in writing regarding the proposals published below. Such views and comments should be submitted in quintuplicate, addressed to the Hearing Clerk, Department of Health, Education and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D. C., prior to the thirtieth day following the date of publication of this notice in the FEDERAL REGISTER:

1. The definition and standard of identity and the standard of fill of container proposed for canned tuna by the National Canners Association are as follows:

§ 37.1 *Canned tuna; definition and standard of identity; label statement of optional ingredients.* (a) Canned tuna is the food consisting of processed fish of the species enumerated in paragraph (b) of this section, prepared in one of the optional forms of pack specified in paragraph (c) of this section, conforming to one of the color designations specified in paragraph (d) of this section, in one of the optional packing media specified in paragraph (e) of this section, and may contain one or more of the seasonings and flavorings specified in paragraph (f) of this section. It is packed in hermetically sealed containers and so processed by heat as to prevent spoilage. It is labeled in accordance with the provisions of paragraph (h) of this section.

(b) The fish included in the class known as tuna fish are:

Thunnus thynnus	Bluefin tuna.[1]
Thunnus maccoyii	Southern bluefin tuna.[1]
Thunnus orientalis	Oriental tuna.[2]
Thunnus germo	Albacore.[2]
Parathunnus mebachi	Big-eyed tuna.[2]
Neothunnus macropterus	Yellowfin tuna.[2]
Neothunnus rarus	Northern bluefin.[2]
Katsuwonus pelamis	Skipjack.[2]
Euthynnus alletteratus	Little tunny.[2]
Euthynnus lineatus	Little tunny.[2]
Euthynnus yaito	Kawakawa.[4]

[1] "A Comparison of the Bluefin Tunas, Genus Thunnus, from New England, Australia, and California," by H. C. Godsil and Edwin K. Holmberg, State of California, Department of Natural Resources, Division of Fish and Game, Bureau of Marine Fisheries, Fish Bulletin No. 77 (1950).

[2] "Contributions to the Comparative Study of the So-called Scombroid Fishes," by Kamakichi Kishinouye, Journal of the College of Agriculture, Imperial University of Tokyo, Vol. VIII, No. 3 (1923).

[3] "A Systematic Study of the Pacific Tunas," by H. C. Godsil and Robert D. Byers, State of California, Department of Natural Resources, Division of Fish and Game, Bureau of Marine Fisheries, Fish Bulletin No. 60 (1944).

[4] "A Descriptive Study of Certain Tuna-Like Fishes," by H. C. Godsil, State of California, Department of Fish and Game, Fish Bulletin No. 97.

The description of each species will be found in the text to which reference is made.

(c) The optional forms of processed tuna consist of loins and other striated muscular tissue of the fish. The loin is the longitudinal quarter of the great lateral muscle freed, in accordance with good commercial practice, from skin, scales, visible blood clots, bones, gills, viscera, and black meat. Black meat is the nonstriated part of the great lateral muscle of tuna, known anatomically as the median superficial muscle, highly vascular in structure, dark in color because of retained blood, and granular in form. Canned tuna is prepared in one of the following forms of pack, the identity of which is determined in accordance with the methods prescribed in paragraph (b) of § 37.2.

(1) Solid or solid pack consists of loins cut in transverse segments to which no free fragments are added. In containers of 1 pound or less of net contents, such segments are cut in lengths suitable for packing in one layer. In containers of more than 1 pound net contents, such segments may be cut in lengths suitable for packing in one or more layers of equal thickness. A piece of a segment may be added if necessary to fill a container. The proportion of free flakes broken from loins in the canning operation shall not exceed 18 percent.

(2) Chunks or chunk style consists of a mixture of pieces of tuna in which the original muscle structure is retained. The pieces may vary in size, but not less than 50 percent of the weight of the pressed contents of a container is retained on ½-inch-mesh screen.

(3) Flakes consist of a mixture of pieces of tuna in which more than 50 percent of the weight of the pressed contents of the container will pass through a ½-inch-mesh screen, but in which the muscular structure of the fish is retained.

(4) Grated consists of a mixture of particles of tuna that have been reduced to uniform size and in which more than 50 percent of the pressed weight of the contents of the container will pass through a ½-inch-mesh screen, and in which the particles are discrete and do not comprise a paste.

(d) Canned tuna, in any of the forms of pack specified in paragraph (c) of this section, falls within one of the following color designations, measured by visual comparison with matte surface neutral reflectance standard corresponding to the specified Munsell units of value, determined in accordance with paragraph (g) of this section:

(1) *White tuna.* This color designation is limited to the species of tuna Thunnus germo (albacore), and is not darker than Munsell value 6.3.

(2) *Light tuna.* This color designation includes any tuna not darker than Munsell value 5.3.

(3) Dark tuna. This color designation includes all tuna darker than Munsell value 5.3.

(4) *Blended tuna.* This color designation may be applied only to tuna flakes specified in paragraph (c) (3) of this section, which consist of a mixture of tuna flakes a substantial portion of which meet the color standard for either white tuna or light tuna, and the remainder of which fall within the color standard for dark tuna. The color designation for blended tuna is determined in accordance with paragraph (g) of this section.

(e) Canned tuna is packed in one of the following optional packing media:

(1) Any edible vegetable oil other than olive oil, or any mixture of such oils not containing olive oil.

(2) Olive oil.

(3) Water.

(f) Canned tuna may be seasoned or flavored with one or more of the following:

(1) Salt.
(2) Purified monosodium glutamate.
(3) Hydrolyzed protein.
(4) Hydrolyzed protein with reduced monosodium glutamate content.
(5) Spices or spice oils or spice extracts.
(6) Vegetable broth or sauce, in an amount not in excess of 5 percent of the volume capacity of the container, such broth or sauce to consist of a minimum of 0.5 percent by weight of vegetable extractives and to be prepared from two or more of the following vegetables: Beans, cabbage, carrots, celery, garlic, onions, parsley, peas, potatoes, red bell peppers and green bell peppers, spinach, and tomatoes.

(g) For determination of the color designations specified in paragraph (d) of this section, the following method shall be used: Recombine the separations of presscake resulting from the method prescribed in § 37.2 (b). Pass the combined portions through a circular sieve 12 inches in diameter, fitted with woven-wire cloth of ¼-inch mesh which complies with the specifications for such wire cloth set forth in "Standard Specifications for Sieves," published March 1, 1940, in L. C. 584 of the U. S. Department of Commerce, National Bureau of Standards. Mix the sieved material by hand, and place a sufficient quantity into a 307 x 113 size container (bearing a top seam and having a false bottom approximately ½-inch deep and painted flat black inside and outside) so that after tamping and smoothing the surface of the sample, the material will be ⅛-inch to ¼-inch below the top of the container.

(1) Determine the Munsell color value of the sample surface by visual comparison, using a comparator eyepiece containing a color filter centering between 550 mμ and 560 mμ, which filter does not pass significant amounts of visible radiation of wavelengths below 540 mμ or above 570 mμ.

(2) The standards with which comparisons are to be made are any essentially neutral matte finish standards of luminous reflectance equivalent to 6.3 and 5.3 Munsell units of value. These standards shall be cut in circles 3¼ inches in diameter and shall be mounted in 307 x 113 size containers, bearing a top seam and painted flat black both inside and outside, so that the surfaces of the standard are 3/16-inch below the top of the containers in which they are mounted.

(3) In the case of blended tuna, the foregoing method shall be varied by first separating, as completely as feasible, the two different colors of tuna flakes, and then proceeding with each portion separately for the determination of its color value.

(h) (1) The specified names of the canned tuna for which definitions and standards of identity are prescribed by this section, except where water is the packing medium, are formed by combining the form of the pack with the color designation of the tuna; for example, "Solid Pack White Tuna," "Grated Dark Tuna," etc. In the case of blended tuna, there shall be used the applicable color designation of the blended flakes determined, in accordance with the color designation of the predominating portion found in the container; for example, "Blended White and Dark Tuna Flakes," "Blended Dark and Light Tuna Flakes."

(2) The specified name of the canned tuna when water is used as the packing medium is formed as described in subparagraph (1) of this paragraph, followed by the words "In water" for example, "Grated Light Tuna in Water."

(3) When the packing medium is vegetable oil or olive oil, the label shall bear the name of the optional packing medium used, as specified in paragraph (e) of this section, preceded by the word "in" or the words "packed in." In the case of the optional ingredient specified in paragraph (e) (1) of this section, the name or names of the oil used may be stated, of the general term "Vegetable Oil" may be used.

(4) In case solid pack white, light, or dark tuna is packed in olive oil, the designation "Tonno" may also appear.

(5) Where the canned tuna contains one of the ingredients listed in paragraph (f) of this section, the label shall bear the statement "Seasoned with ————," the blank being filled in with the name or names of the ingredient or ingredients used, except that if the ingredient designated in paragraph (f) (6) of this section is used, the label shall bear the statement "Seasoned with Vegetable Broth" or "Seasoned with Vegetable Sauce," and if the ingredient designated in paragraph (f) (5) of this section is used alone, the label may bear the statement "Spiced" or "With Added Spice."

(6) Wherever the name of the food appears on the label so conspicuously as to be easily seen under customary conditions of purchase, the names of the optional ingredients used as specified by subparagraphs (3) and (5) of this paragraph shall immediately and conspicuously precede or follow such name without intervening written, printed, or graphic matter, except that the common name of the species of tuna fish used may be so intervened, but the species name "albacore" may be employed only for fish of that species which meets the color designation prescribed by paragraph (d) (1) of this section.

§ 37.2 *Canned tuna; fill of container; label statement of substandard fill.* (a) (1) The standard of fill of container for canned tuna is a fill such that the average weight of the pressed cake from 24 cans, as determined by the method prescribed by paragraph (b) of this section, is not less than the minimum value specified for the corresponding can size and form of tuna ingredient in the following table:

I. Can size and form of tuna ingredient	II. Minimum value for weights of pressed cake (average of 24 cans)
211 x 109:	*Ounces*
Solid	2.25
Chunks	1.98
Flakes	1.98
Grated	2.00
307 x 113:	
Solid	4.47
Chunks	3.92
Flakes	3.92
Grated	3.96
401 x 206:	
Solid	8.76
Chunks	7.68
Flakes	7.68
Grated	7.76
603 x 408:	
Solid	43.2
Chunks	37.9
Flakes	37.9
Grated	38.3

If the can size in question is not listed, calculate the value for column II as follows: From the list select as the comparable can size that one which has nearest the water capacity of the can size in question and multiply the value listed in column II for the same form of tuna ingredient by the water capacity of the can size in question and divide by the water capacity of the comparable can size. Water capacities are determined by the general method provided in § 10.2 (a) of this chapter.

(b) The methods referred to in paragraph (a) of this section for determining the weight of the pressed cake and referred to in § 37.1 (c) for determining the percent of free flakes and the percent of pieces which pass through a ½-inch-mesh sieve are as follows:

(1) Have each of the 24 cans and contents at a temperature between 65° F. and 80° F. Test each can in turn as follows:

(2) Cut out the top of the can (code end), using a can opener that does not remove nor distort the double seam.

(3) With the cut top held on the can contents, invert the can, and drain the free liquid by gently pressing on the cut lid with the fingers so that most of the free liquid comes from the can.

(4) With the cut lid still in place, cut out the bottom of the can with the can opener, then turn the can upright and remove the cut can top (code end). Scrape off any adhering tuna particles into the tuna mass in the can.

(5) Place the proper size press cylinder as provided in paragraph (c) (1) of this section in a horizontal position on a table, then using the cut bottom of the can as a pusher, gently force the can contents from the can into the cylinder. Remove the bottom of the can that was used as the pusher and scrape any adhering particles from the can body and bottom of the can, and put them in the cylinder.

(6) Place the cylinder plunger on top of the can contents in the cylinder. Remove the eyebolt and put the cylinder and plunger in position on the press (paragraph (c) (3) of this section).

(7) Begin the operation of the hydraulic ram of the press, and as soon as liquid is observed coming from the plunger start timing the operation. Apply pressure to the plunger slowly, so that a full minute is used to reach a pressure of 414 pounds per square inch on the can contents. Hold this pressure for 1 additional minute and then release the pressure. Tip the press cylinder so that any free liquid is drained out.

(8) Remove the piston from the pressing cup. Loosen the cake from the cup with a thin blade and remove the entire press cake as gently as possible, to keep the mass in a single cake during this operation. Place the cake and any pieces that adhered to the piston and pressing cup in a tared receiving pan and determine the weight of the pressed material.

(9) For cans larger than 401 x 206: Cut out the top of the can and drain off free liquid from the can contents as in subparagraphs (2) and (3) of this paragraph. Determine the gross weight of the can and remaining contents. Using a tared core cutter as provided for in paragraph (c) (2) of this section, cut vertically a core of the drained material in the can. Determine the weight of the core. With a thin spatula transfer the core to the pressing cup for 401 x 206

cans. Determine the press weight as in subparagraphs (5) and (8) of this paragraph. Remove the remaining drained contents of the can, reserving the contents for the determination of free flakes (subparagraph (11) of this paragraph), weigh the empty can, and calculate the weight of the total drained material. Calculate the weight of presscake on the entire can basis by multiplying the weight of the presscake of the core by the ratio of the weight of the drained contents of the can to the weight of the core before pressing.

(10) Repeat the press-weight determination on the remainder of the 24 cans and determine the average weight for the purpose of paragraph (a) of this section.

(11) Determination of free flakes: If the optional form of tuna ingredient is solid pack, determine the percent of free flakes. Only fragments that were broken in the canning procedure are considered to be free flakes. If the can is of such size that its entire drained contents were pressed as described in subparagraphs (1) to (8), inclusive, of this paragraph, examine the presscake carefully for free flakes; using a spatula, scrape free flakes gently from the outside of the cake. Examine the body of the presscake itself as carefully as possible for free flakes that may have been added in the packing. Weigh the total free flakes and determine the percent by weight of flakes to the total weight of presscake. If the can is of such size that a core was cut out for pressing as described in subparagraph (9) of this paragraph, make the examination for free flakes on a weighed portion of the drained material remaining after the core was removed. The weight of the portion should approximately equal the weight of the core before pressing. Carefully examine the weighed portion, pick out free flakes and weigh them. Calculate the weight of the free flakes as a percentage of the weight of the portion examined.

(12) Determination of particle size: If the optional form of tuna ingredient is chunks, flakes, or grated, the presscake resulting from the operations described in subparagraphs (1) to (9), inclusive, of this paragraph is gently separated by hand, care being taken to avoid breaking the pieces. The separated pieces are evenly distributed over the top sieve of the screen separation equipment described in paragraph (c) (4) of this section. Beginning with the top screen, lift and drop each sieve by its open edge three times. Each time, the open edge of the sieve is lifted the full distance permitted by the device. Combine and weigh the material remaining on the three top screens (1½-inch, 1-inch, ½-inch screens), and determine the combined percentage retention by weight in relation to the total press weight.

(c) (1) The pressing cups and pistons referred to in paragraph (b) of this section are made of stainless steel. The pressing cups are made with a lip to facilitate collection of the liquid. Pistons have a threaded center hole about half as deep as the thickness of the piston. The hole is for receiving a ringbolt to assist in removing the piston from the pressing cup. Dimensions for pressing cups and pistons are as follows:

For can size 211 x 209

Pressing cup:
Inside depth, approximately 3¾ inches.
Inside diameter, 2.593 inches.
Wall thickness, approximately ⅜ inch.
Piston:
Thickness, approximately 1 inch.
Diameter, 2.568 inches.

For can size 307 x 113

Pressing cup:
Inside depth, approximately 4 inches.
Inside diameter, 3.344 inches.
Wall thickness, approximately ⅜ inch.
Piston:
Thickness, approximately 1¼ inches.
Diameter, 3.319 inches.

For can size 401 x 206

Pressing cup:
Inside depth, approximately 4⅛ inches.
Inside diameter, 3.969 inches.
Wall thickness, approximately ½ inch.
Piston:
Thickness, approximately 1¼ inches.
Diameter, 3.944 inches.

For can sizes where the diameter is greater than 401, the core cutter described in subparagraph (2) of this paragraph shall be used and the resulting core pressed in the pressing cup for can size 401 x 206. For can sizes differing from those specified above, special pressing cups and pistons may be used. Special pressing cups have inside diameters 1/10-inch less than the outside diameters at the double seam for the can sizes for which the cups are used, and the piston diameters are 0.025 inch less than the inside diameters of the pressing cups.

(2) The core cutter referred to in paragraphs (b) (9) and (11) of this section and subparagraph (1) of this paragraph is made from a previously sealed 300 x 407 can. The cover, including the top seam, is cut out. The edge is smoothed and sharpened. A small hole to permit passage of air is made in the bottom.

(3) The hydraulic press referred to in paragraph (b) (6) to (10), inclusive, of this section is made by so mounting a hydraulic jack in a strong frame that it will press horizontally against the center of the piston in the pressing cup used. The frame should be so braced that it does not change shape when pressure is applied. Provision is made for collecting the pressed-out liquid in a suitable receptacle. The gauge on the hydraulic jack is so calibrated that it will indicate for the piston being used when the piston is pressing against the contents of the pressing cup with a pressure of 414 pounds per square inch of piston face.

(4) The sieving device referred to in paragraph (b) (12) of this section consists of three sieves, each approximately 1 foot square, loosely mounted, one above the other, in a metal frame. The mesh in the top sieve complies with the specifications for 1½-inch woven-wire cloth as set forth in "Standard Specifications for Sieves," as published March 1, 1940, in L. C. 584 of the U. S. Department of Commerce, National Bureau of Standards. The meshes in the sieves below comply with similar specifications for 1-inch and ½-inch woven-mesh cloth as set forth in the same publication. The sides of each sieve are formed from ¾-inch metal strap. The frame has tracks made of ⅜-inch angle metal to support each sieve under each side. The tracks are so positioned as to permit each sieve a free vertical travel of 1¾ inches.

(d) If canned tuna falls below the applicable standard of fill of container prescribed in paragraph (a) of this section, the label shall bear the general statement of substandard fill provided in § 10.3 (b) of this chapter, in the manner and form therein specified.

2. The proposals of Hawaiian Tuna Packers Limited are as follows:

a. That § 37.1 (g) and (h) in the above-proposed standard of identity for canned tuna be redesignated as (h) and (i), respectively, and that a new paragraph (g), reading as follows, be inserted therein:

(g) Any one of the forms of pack of canned tuna specified in paragraph (c) of this section may be smoked. Canned smoked tuna will be labeled in accordance with the provisions of paragraph (i) (5) of this section.

b. In § 37.1 (i), redesignated as above, subparagraphs (5) and (6) would be redesignated as (6) and (7), respectively, and it is proposed that a new subparagraph (5), reading as follows, be inserted therein:

(5) In case any of the forms of canned tuna specified in paragraph (c) of this section are smoked, the designation "Smoked" shall appear on the label, as for example, "Light Smoked Tuna Flakes."

3. The proposal of the California Fish Canners Association, Inc., is as follows: That the proposed standard of identity for canned tuna fish submitted by the National Canners Association et al. be amended to incorporate garlic as an ingredient, under § 37.1 (f) of the proposal. Paragraph (f) would read as follows:

(f) Canned tuna may be seasoned or flavored with one or more of the following:
(1) Salt.
(2) Purified monosodium glutamate.
(3) Hydrolyzed protein.
(4) Hydrolyzed protein with reduced monosodium glutamate content.
(5) Spices or spice oils or spice extracts.
(6) Vegetable broth or sauce, in an amount not in excess of 5 percent of the volume capacity of the container, such broth or sauce to consist of a minimum of 0.5 percent by weight of vegetable extractives and to be prepared from two or more of the following vegetables: Beans, cabbage, carrots, celery, garlic, onions, parsley, peas, potatoes, red bell peppers, green bell peppers, spinach, and tomatoes.
(7) Garlic.

Dated: August 20, 1956.

[SEAL] JOHN L. HARVEY,
Deputy Commissioner of Food and Drugs.

Department of the Interior

FISH AND WILDLIFE ACTIVITIES TO BE REORGANIZED:

Action has been initiated to reorganize the fish and wildlife activities of the Department of the Interior to carry out the provisions of the "Fish and Wildlife Act of 1956" (which was signed August 8 by the President), Secretary Fred A. Seaton announced on August 16.

Secretary Seaton described the new law as "an important step forward in providing greater recognition at the national level of the country's vital stake in fish and wildlife conservation."

"This Act," he said, "will enable the commercial fishing industry to attain its proper place in the national economy and will assure sportsmen that the Federal Government is increasing its management efforts to develop adequate fish and wildlife resources for recreational purposes."

Under the terms of the Act, two new top-level posts will be established. One will be an Assistant Secretary for Fish and Wildlife, and the other will be a Commissioner of Fish and Wildlife. Appointments to these positions will be made by the President and will be subject to Senate confirmation. Secretary Seaton said that no decision has been reached as to who will fill these two positions.

The new Assistant Secretary position is the first to be created since May 24, 1950, when four Assistant Secretaries were authorized by Congress. It is the first major reorganization of the Fish and Wildlife Service since 1940 when the Bureau of Biological Survey and the Bureau of Fisheries were combined to form the service.

The Act also provides for the creation within the Department of a new U.S. Fish and Wildlife Service which will replace the presently existing Fish and Wildlife Service. The new Service will consist of two separate agencies, each of which will have the status of a Federal bureau. One of these agencies will be known as the "Bureau of Commercial Fisheries" and the other as the "Bureau of Sport Fisheries and Wildlife." Each bureau will be headed by a director who will be appointed by the Secretary of the Interior.

Both Directors will handle their responsibilities under the direction of the Commissioner who, in turn, will be subject to the supervision of the Assistant Secretary for Fish and Wildlife.

The Bureau of Commercial Fisheries will be responsible for all functions of the Service pertaining to commercial fisheries, whales, fur seals, sea lions, and related matters.

The new law directs the Secretary to effect the reorganization of the Service as soon as practicable but not later than 90 calendar days after its approval.

One of the new functions authorized by the Fish and Wildlife Act of 1956, and proposed by the Department of the Interior, is the making of loans at three percent interest to mature in not more than 10 years for "financing and refinancing of operations, maintenance, replacement, repair, and equipment of fishing gear and vessels, and for research into the basic problems of fisheries."

A fisheries loan fund will be created to be used by the Secretary as a revolving fund to make these loans. The Act authorized $10 million to provide initial capital. The actual appropriation of this sum was included in the Second Supplemental Appropriation Act for 1957 passed by the 84th Congress shortly before adjournment.

Another highlight of the Fish and Wildlife Act of 1956, also proposed by the Department, is the extension of provisions of the Saltonstall-Kennedy Act of July 1, 1954. This Act gave the Department of the Interior, for a three-year period ending June 30, 1957, 30 percent of the gross receipts from duties collected under the customs laws on fishery products to promote the free flow of domestically-produced fishery products. The new law continues this arrangement on a permanent basis. The limitation of $3 million annually on the funds has been removed and the money becomes available on an "annual accrual" basis. This is expected to increase the amount to about $5 million.

Secretary Seaton pointed out that this balanced program of technological, economic, market development, and biological studies and services to aid the domestic fishing industry has been highly commended by the industry during its first two years of operation. At the last meeting of the American Fishery Advisory Committee, held in May at Long Beach, Calif., the committee went on record for an "enlarged and extended Saltonstall-Kennedy Act as the best way to aid the industry."

The Fish and Wildlife Act of 1956 also provides for the transfer to the Secretary of the Interior of "all functions of the Secretary of Agriculture, the Secretary of Commerce, and the head of any other department or agency, as determined by the Director of the Bureau of the Budget to relate primarily to the development, advancement, management, conservation, and protection of commercial fisheries." This provision, however, does not affect the authority of the Secretary of State to negotiate or enter into any international agreements or conventions concerned with fish and wildlife resources.

President Eisenhower in signing the bill (S. 3275) August 8, issued the following statement:

"In signing this bill, I do not regard as a directive the provisions of section 8 which relate to United States representation at international conferences and negotiations concerning fish and wildlife matters. If they were to be so construed they would, in my judgment, be unconstitutional as limitations on the authority of the President of the United States to conduct negotiations with other governments through agents designated by him or at his direction. Accordingly, I regard these provisions as merely an indication of the desire of the Congress that the resources of the Interior Department be utilized in the formulation of United States policies affecting fish and wildlife matters, which of course I fully share and which is and has been my policy."

Tariff Commission

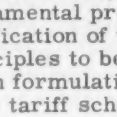
TIME FOR REVIEW OF CUSTOMS TARIFF SCHEDULES EXTENDED:

Public Law 934, approved August 2, 1956, provides an extension of time for the Tariff Commission to complete the review of the customs tariff schedules authorized by section 101 of the Customs Simplification Act of 1954. The Tariff Commission is making a comprehensive study of the laws of the United States prescribing the tariff status of imported articles and will submit to the President and to the Chairmen of the Ways and Means Committee of the House of Representatives and the Finance Committee of the Senate, not later than March 1, 1958, a review and consolidation of these laws which, in the judgment of the Commission, will to the extent practicable: (1) establish schedules of tariff classifications which will be logical in arrangement and terminology and adapted to the changes which have occurred since 1930 in the character and importance of articles produced in and imported into the United States and in the markets in which they are sold; (2) eliminate anomalies and illogical results in the classification of articles; (3) simplify the determination and application of tariff classifications.

The Commission again invites importers, domestic producers, customs brokers, and other interested parties to submit any suggestions which in their opinion may accomplish the purposes indicated. The Commission is finding that suggestions previously submitted are most helpful in this undertaking, and additional suggestions will be appreciated. Suggestions should be in quintuplicate, and should be addressed to the General Counsel, United States Tariff Commission, Washington 25, D. C.

After the Commission has prepared a draft of revised tariff schedules, such draft will be made public and hearings will be scheduled for the purpose of affording interested parties opportunity to be heard with respect thereto, particularly with respect to the probable effect upon domestic industry of any changes in duties which may be involved in the proposed revision.

Copies of the Commission's Interim Report, dated March 15, 1955, treating the more fundamental problems underlying a simplification of the tariff schedules, the principles to be followed by the Commission in formulating the proposed revision of the tariff schedules, and methods for putting the proposed revision into force and effect, may be obtained from the Secretary, United States Tariff Commission, Washington 25, D.C.



Eighty-Fourth Congress (Second Session)

Listed below and on the following pages are public bills and resolutions that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown when introduced; from month to month the more pertinent reports, hearings, or chamber actions on the bills shown are published; and if passed, they are shown when signed by the President.

Both the House and Senate adjourned sine die on July 27, 1956. Bills introduced in either the first or second session of the 84th Congress which failed to pass during either session will have to be re-introduced in the 85th Congress (which convenes in January 1957).

COMMERCIAL FISHERIES EDUCATIONAL PROGRAM: S. 2379, a bill to promote the fishing industry in the United States and its Territories by providing for the training of needed personnel for such industry. Signed by the President August 8, 1956 (P. L. 1027).

Public Law 1027 - 84th Congress
Chapter 1039 - 2d Session
S. 2379

AN ACT

All 70 Stat. 1126.

To promote the fishing industry in the United States and its Territories by providing for the training of needed personnel for such industry.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) the Secretary of the Interior is authorized to make grants, out of funds appropriated for the purposes of this section, to public and nonprofit private universities and colleges in the several States and Territories of the United States for such purposes as may be necessary to promote the education and training of professionally trained personnel (including scientists, technicians, and teachers) needed in the field of commercial fishing. Any amount appropriated for the purposes of this section shall be apportioned on an equitable basis, as determined by the Secretary of the Interior, among the several States and Territories for the purpose of making grants within each such State and Territory. In making such apportionment the Secretary of the Interior shall take into account the extent of the fishing industry within each State and Territory as compared with the total fishing industry of the United States (including Territories), and such other factors as may be relevant in view of the purposes of this section. Fishing industry. Personnel training grants.

(b) There are authorized to be appropriated not in excess of $550,000 for the fiscal year beginning on July 1, 1955, and for each fiscal year thereafter for the purposes of this section. Appropriation.

(c) The Secretary of the Interior may establish such regulations as may be necessary to carry out the provisions of this section. Regulations.

Sec. 2. (a) Section 3 (a) of the Vocational Education Act of 1946 is amended by inserting after paragraph (4) the following new paragraph: 60 Stat. 775. 20 USC 15j.

"(5) $375,000 for vocational education in the fishery trades and industry and distributive occupations therein, to be apportioned for expenditure in the several States and Territories on an equitable basis, as determined by the United States Commissioner of Education after consultation with the Secretary of the Interior, taking into account the extent of the fishing industry of each State and Territory as compared with the total fishing industry of the United States (including Territories)." Appropriation.

(b) Section 3 (b) of such Act is amended by striking out "paragraphs (1) to (4)" and inserting in lieu thereof "paragraphs (1) to (5)".

Approved August 8, 1956.

CUSTOMS SIMPLIFICATION ACT: H. R. 6040 (amended), a bill to amend certain administrative provisions of the Tariff Act of 1930 and to repeal obsolete provisions of the customs laws. Signed by the President August 2, 1956 (P. L. 927). The principal provision of the bill is that duties levied on imported products that are taxable according to their value shall, with certain exceptions, be primarily computed on the basis of "export value." A statement by the President on this bill pointed out in part: "...The heart of this measure is a revision of valuation procedures. This change will do more than any other single measure to free the importation of merchandise from customs complications and pitfalls for the inexperienced importer. It allows our customs value decisions to be based on normal commercial values current in trade with the United States. It permits businessmen to predict with greater certainty the amount of tariff duty to be paid on imports. It simplifies the valuation work of the Bureau of Customs and reduces delay in the assessment of duties.

"I am also particularly gratified to approve H. R. 6040 because it marks the culmination of the legislative proposals which this administration has made for customs simplification and customs management improvement. The Customs Simplification Act of 1953 made many important changes in customs administrative provisions which have resulted in more certain and equitable duty assessments. The Customs Simplification Act of 1954 began a study by the United States Tariff Commission looking toward a much-needed revision of the tariff classification schedules of 1930 and made helpful changes in the administration of the antidumping laws. With the passage H. R. 6040 all of the principal improvements relating to customs procedures recommended on January 23, 1954, by the Commission on Foreign Economic Policy, which I endorsed in my special message of March 30, 1954, have now been authorized or undertaken.

"The legislation previously passed by the Congress, together with the regulatory and administrative changes made by the Treasury Department and the Bureau of Customs, have in the past 3 years cut the average time required for a final decision on customs duties from about 1 year to less than 6 months. Further progress in this direction is expected, and I am confident that H. R. 6040 will contribute to it. ..."

H. R. 12254, a bill to provide additional time for the Tariff Commission to review the customs tariff schedules. House Committee on Ways and Means reported to House July 19 with amendment (H. Rept. No. 2815). House amended and passed July 21. Referred to Senate Committee on Finance, reported by that Committee to Senate July 25 (S. Rept. No. 2780), and passed Senate July 26. Signed by the President August 2, 1956 (P. L. 934).

Provides additional time for the Tariff Commission to complete the review of the customs tariff schedules authorized by section 101 of the Customs Simplification Act of 1954. As matters now stand, the Tariff Commission is making a comprehensive study of the laws of the United States prescribing

the tariff status of imported articles and will submit to the President and to the Chairmen of the Ways and Means Committee of the House of Representative and the Finance Committee of the Senate, not later than March 1, 1958, a review and consolidation of these laws which, in the judgment of the Commission, will to the extent practicable: (1) Establish schedules of tariff classifications which will be logical in arrangement and terminology and adapted to the changes which have occurred since 1930 in the character and importance of articles produced in and imported into the United States and in the markets in which they are sold. (2) Eliminate anomalies and illogical results in the classification of articles. (3) Simplify the determination and application of tariff classifications.

FISH AND WILDLIFE ACT OF 1956; S. 3275, a bill to establish a sound and comprehensive national policy with respect to fisheries and wildlife; to strengthen the fisheries and wildlife segments of the national economy; to create and establish within the department of the Interior the Office of Assistant Secretary for Fisheries and Wildlife, a United States Fish and Wildlife Service; and for other purposes. Signed by the President August 8, 1956 (P. L. 1024). A statement by the President on this bill indicated: "I have signed S. 3275, The Fish and Wildlife Act of 1956. In signing this bill, I do not regard as a directive the provisions of section 8 which relate to United States representation at international conferences and negotiations concerning fish and wildlife matters. If they were to be so construed they would, in my judgment, be unconstitutional as limitations on the authority of the President of the United States to conduct negotiations with other governments through agents designated by him or at his direction. Accordingly, I regard these provisions as merely an indication of the desire of the Congress that the resources of the Interior Department be utilized in the formulation of United States policies affecting fish and wildlife matters, which of course I fully share and which is and has been my policy.

Public Law 1024 - 84th Congress
Chapter 1036 - 2d Session
S. 3275

AN ACT

70 Stat. 1119.

To establish a sound and comprehensive national policy with respect to fish and wildlife; to strengthen the fish and wildlife segments of the national economy; to establish within the Department of the Interior the position of Assistant Secretary for Fish and Wildlife; to establish a United States Fish and Wildlife Service; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Fish and Wildlife Act of 1956". Fish and Wildlife Act of 1956.

DECLARATION OF POLICY

SEC. 2. The Congress hereby declares that the fish, shellfish, and wildlife resources of the Nation make a material contribution to our national economy and food supply, as well as a material contribution to the health, recreation, and well-being of our citizens; that such resources are a living, renewable form of national wealth that is capable of being maintained and greatly increased with proper management, but equally capable of destruction if neglected or unwisely exploited; that such resources afford outdoor recreation throughout the Nation and provide employment, directly or indirectly, to a substantial number of citizens; that the fishing industries strengthen the defense of the United States through the provision of a trained seafaring citizenry and action-ready fleets of seaworthy vessels; that the training and sport afforded by fish and wildlife resources strengthen the national defense by contributing to the general health and physical fitness of millions of citizens; and that properly developed, such fish and wildlife resources are capable of steadily increasing these valuable contributions to the life of the Nation.

The Congress further declares that the fishing industry, in its several branches, can prosper and thus fulfill its proper function in national life only if certain fundamental needs are satisfied by means that are consistent with the public interest and in accord with constitutional functions of governments. Among these needs are:

(1) Freedom of enterprise—freedom to develop new areas, methods, products, and markets in accordance with sound economic principles, as well as freedom from unnecessary administrative or legal restrictions that unreasonably conflict with or ignore economic needs;

(2) Protection of opportunity—maintenance of an economic atmosphere in which domestic production and processing can prosper; protection from subsidized competing products; protection of opportunity to fish on the high seas in accordance with international law;

(3) Assistance—assistance consistent with that provided by the Government for industry generally, such as is involved in promoting good industrial relations, fair trade standards, harmonious labor relations, better health standards and sanitation; and including, but not limited to—

(a) services to provide current information on production and trade, market promotion and development, and an extension service,

(b) research services for economic and technologic development and resource conservation, and

(c) resource management to assure the maximum sustainable production for the fisheries.

The Congress further declares that the provisions of this Act are necessary in order to accomplish the objective of proper resource development, and that this Act shall be administered with due regard to the inherent right of every citizen and resident of the United States to engage in fishing for his own pleasure, enjoyment, and betterment, and with the intent of maintaining and increasing the public opportunities for recreational use of our fish and wildlife resources, and stimulating the development of a strong, prosperous, and thriving fishery and fish processing industry.

REORGANIZATION WITHIN THE DEPARTMENT OF THE INTERIOR

Assistant Secretary for Fish and Wildlife; Commissioner of Fish and Wildlife.

SEC. 3. (a) There is hereby established within the Department of the Interior the position of Assistant Secretary for Fish and Wildlife, and the position of Commissioner of Fish and Wildlife. Such Assistant Secretary shall be appointed by the President, by and with the advice and consent of the Senate, and shall be compensated at the same rate as other Assistant Secretaries. The Commissioner shall be appointed by the President by and with the advice and consent of the Senate. He shall receive compensation at the same rate as that provided for Grade GS-18. There is also established a United States Fish and Wildlife Service within the Department, consisting of two separate agencies, each of which shall have the status of a Federal bureau. There shall be a Director of each of said Bureaus appointed by the Secretary at Grades GS-17 each. One of the agencies shall be known as the "Bureau of Commercial Fisheries" and the other agency shall be known as the "Bureau of Sport Fisheries and Wildlife". The United States Fish and Wildlife Service, except as prescribed by this Act, shall succeed to and replace the presently existing Fish and Wildlife Service of the Department.

U. S. Fish and Wildlife service.

(b) The functions of the United States Fish and Wildlife Service hereby established shall be administered under the supervision of the said Commissioner of Fish and Wildlife, who shall be subject to the supervision of the Assistant Secretary for Fish and Wildlife.

(c) All functions and responsibilities placed in the Department of the Interior or any official thereof by this Act shall be included among the functions and responsibilities of the Secretary of the Interior, as the head of the Department, and shall be carried out under his direction pursuant to such procedures or delegations of authority as he may deem advisable and in the public interest.

Distribution of duties, etc.

(d) In order to make a proper distribution between the two Bureaus of the United States Fish and Wildlife Service established by this Act, the previously existing functions, powers, duties, authority, liabilities, commitments, personnel, records, and other properties or matters previously handled by or administered through the former Fish and Wildlife Service of the Department, shall be distributed as follows:

(1) The Bureau of Commercial Fisheries shall be responsible for those matters to which this Act applies relating primarily to commercial fisheries, whales, seals, and sea-lions, and related matters:

(2) The Bureau of Sport Fisheries and Wildlife shall be responsible for those matters to which this Act applies relating primarily to migratory birds, game management, wildlife refuges, sport fisheries, sea mammals (except whales, seals and sea-lions), and related matters; and the funds and allocations, appropriated or otherwise, relating to the matters covered by paragraphs (1) and (2) of this subsection shall be distributed between such Bureaus as the Secretary of the Interior shall determine.

(e) Except as changed by the terms of this Act or by subsequent laws or regulations, all laws and regulations now in effect relating to matters heretofore administered by the Department of the Interior through the former Fish and Wildlife Service as heretofore existing, shall remain in effect.

Administrative procedures.

(f) In recognition of the need for authority to execute the purposes of this Act effectively, the Secretary of the Interior shall exercise such general administrative authority consistently with the terms of this Act as he shall find to be necessary to carry out the provisions of this Act effectively and in the public interest. In order to allow sufficient time to place the reorganizations under this Act into effect, the Secretary is authorized to establish an effective procedure and date of such reorganizations, notice of which shall be published in the Federal Register. Such reorganization shall be accomplished as soon as practicable after the approval of this Act, but not later than ninety (90) calendar days after such approval.

Publication of notice in FR.

LOAN PROCEDURES

SEC. 4. (a) The Secretary is authorized under rules and regulations and under terms and conditions prescribed by him, to make loans for financing and refinancing of operations, maintenance, replacement, repair, and equipment of fishing gear and vessels, and for research into the basic problems of fisheries.

(b) Any loans made under the provisions of this section shall be subject to the following restrictions:

(1) Bear an interest rate of not less than 3 per centum per annum;

(2) Mature in not more than ten years;

(3) No financial assistance shall be extended pursuant to this section unless reasonable financial assistance applied for is not otherwise available on reasonable terms.

(c) There is hereby created a fisheries loan fund, which shall be used by the Secretary as a revolving fund to make loans for financing and refinancing under this section. Any funds received by the Secretary on or before June 30, 1965, in payment of principal or interest on any loans so made, shall be deposited in the fund and be available for making additional loans under this section. Any funds so received after June 30, 1965, and any balance remaining in the fund at the close of June 30, 1965 (at which time the fund shall cease to exist), shall be covered into the Treasury as miscellaneous receipts. There

are hereby authorized to be appropriated to the fund the sum of $10,000,000 to provide initial capital.

(d) The Secretary, subject to the specific limitations in this section, may consent to the modification, with respect to the rate of interest, time of payment of any installment of principal, or security, of any loan contract to which he is a party.

INVESTIGATIONS, INFORMATION, REPORTS

SEC. 5. (a) The Secretary shall conduct continuing investigations, prepare and disseminate information, and make periodical reports to the public, to the President, and to Congress, with respect to the following matters:

(1) The production and flow to market of fish and fishery products domestically produced, and also those produced by foreign producers which affect the domestic fisheries;

(2) The availability and abundance and the biological requirements of the fish and wildlife resources;

(3) The competitive economic position of the various fish and fishery products with respect to each other, and with respect to competitive domestic and foreign-produced commodities;

(4) The collection and dissemination of statistics on commercial and sport fishing;

(5) The collection and dissemination of statistics on the nature and availability of wildlife, progress in acquisition of additional refuges and measures being taken to foster a coordinated program to encourage and develop wildlife values;

(6) The improvement of production and marketing practices in regard to commercial species and the conduct of educational and extension services relative to commercial and sport fishing, and wildlife matters;

(7) Any other matters which in the judgment of the Secretary are of public interest in connection with any phases of fish and wildlife operations.

TRANSFER OF FUNCTIONS—ASSISTANCE OF OTHER AGENCIES

SEC. 6. (a) There shall be transferred to the Secretary all functions of the Secretary of Agriculture, the Secretary of Commerce, and the head of any other department or agency, as determined by the Director of the Bureau of the Budget to relate primarily to the development, advancement, management, conservation, and protection of commercial fisheries; but nothing in this section shall be construed to modify the authority of the Department of State or the Secretary of State to negotiate or enter into any international agreements, or conventions with respect to the development, management, or protection of any fisheries and wildlife resources or with respect to international commissions operating under conventions to which the United States is a party.

(b) There shall be transferred to the Department of the Interior so much of the personnel, property, facilities, records, and unexpended balances of appropriations, allocations, and other funds (available or to be made available) as the Director of the Bureau of the Budget determines to be necessary in connection with the exercise of any functions transferred to the Secretary pursuant to subsection (a) of this section.

(c) The Secretary may request and secure the advice or assistance of any department or agency of the Government in carrying out the provisions of this Act, and any such department or agency which furnishes advice or assistance to the Secretary may expend its own funds for such purposes, with or without reimbursement from the Secretary as may be agreed upon between the Secretary and the department or agency.

POLICIES, PROCEDURES, RECOMMENDATIONS

SEC. 7. (a) The Secretary of the Interior, with such advice and assistance as he may require from the Assistant Secretary for Fish and Wildlife, shall consider and determine the policies and procedures that are necessary and desirable in carrying out efficiently and in the public interest the laws relating to fish and wildlife. The Secretary, with the assistance of the departmental staff herein authorized, shall—

(1) develop and recommend measures which are appropriate to assure the maximum sustainable production of fish and fishery products and to prevent unnecessary and excessive fluctuations in such production;

(2) study the economic condition of the industry, and whenever he determines that any segment of the domestic fisheries has been seriously disturbed either by wide fluctuation in the abundance of the resource supporting it, or by unstable market or fishing conditions or due to any other factors he shall make such recommendations to the President and the Congress as he deems appropriate to aid in stabilizing the domestic fisheries;

(3) develop and recommend special promotional and informational activities with a view to stimulating the consumption of fishery products whenever he determines that there is a prospective or actual surplus of such products;

(4) take such steps as may be required for the development, advancement, management, conservation, and protection of the fisheries resources; and

(5) take such steps as may be required for the development, management, advancement, conservation, and protection of wildlife resources through research, acquisition of refuge lands, development of existing facilities, and other means.

STATE DEPARTMENT—COOPERATION

SEC. 8. (a) The Secretary shall cooperate to the fullest practicable extent with the Secretary of State in providing representation at all meetings and conferences relating to fish and wildlife in which representatives of the United States and foreign countries participate.

The Secretary of State shall designate the Secretary of the Interior or the Assistant Secretary for Fish and Wildlife, or a person designated by the Secretary of the Interior to represent the Department of the Interior, as a member of the United States delegation attending such meetings and conferences and also as a member of the negotiating team of any such delegation.

(b) The Secretary of State and all other officials having responsibilities in the fields of technical and economic aid to foreign nations shall consult with the Secretary in all cases in which the interests of fish and wildlife are involved, with a view to assuring that such interests are adequately represented at all times.

(c) Notwithstanding any other provision of law, the Secretary shall be represented in all international negotiations conducted by the United States pursuant to section 350 of the Tariff Act of 1930, as amended, in any case in which fish products are directly affected by such negotiations. 68 Stat. 943. 19 USC 1351.

(d) The Secretary shall consult periodically with the various governmental, private nonprofit, and other organizations and agencies which have to do with any phase of fish and wildlife with respect to any problems that may arise in connection with such fish and wildlife.

REPORTS ON ACTIVITIES AND IMPORTS

SEC. 9. (a) The Secretary of the Interior shall make an annual report to the Congress with respect to activities of the United States Fish and Wildlife Service under this Act, and shall make such recommendations for additional legislation as he deems necessary. Report to Congress.

(b) The Secretary is authorized to make a report to the President and the Congress, and, when requested by the United States Tariff Commission in connection with section 7 of the Trade Agreements Extension Act of 1951, as amended (67 Stat. 73, 74), or when an investigation is made under the Tariff Act of 1930 (19 U. S. C. 1332), the Secretary is authorized to make a report to such Commission, concerning the following matters with respect to any fishery product which is imported into the United States, or such reports may be made upon a request from any segment of the domestic industry producing a like or directly competitive product— 65 Stat. 76, 19 USC 1364.

(1) whether there has been a downward trend in the production, employment in the production, or prices, or a decline in the sales, of the like or directly competitive product by the domestic industry; and

(2) whether there has been an increase in the imports of the fishery products into the United States, either actual or relative to the production of the like or directly competitive product produced by the domestic industry.

THE RIGHTS OF STATES

SEC. 10. Nothing in this Act shall be construed (1) to interfere in any manner with the rights of any State under the Submerged Lands Act (Public Law 31, Eighty-third Congress) or otherwise provided by law, or to supersede any regulatory authority over fisheries exercised by the States either individually or under interstate compacts; or (2) to interfere in any manner with the authority exercised by any International Commission established under any treaty or convention to which the United States is a party. 67 Stat. 29.

AUTHORIZATION FOR APPROPRIATION

SEC. 11. There are hereby authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act.

SEC. 12. (a) The authorization for the transfer of certain funds from the Secretary of Agriculture to the Secretary of the Interior and their maintenance in a separate fund as contained in section 2 (a) of the Act of August 11, 1939, as amended July 1, 1954 (68 Stat. 376), shall be continued for the year ending June 30, 1957, and each year thereafter.

(b) Subsection (e) of section 2 of the aforesaid Act of August 11, 1939, as amended, is hereby amended to read as follows:

"(e) The separate fund created for the use of the Secretary of the Interior under section 2 (a) of this Act and the annual accruals thereto shall be available for each year hereafter until expended by the Secretary."

Approved August 8, 1956.

FISH HATCHERIES: S. 3831, a bill to provide for the establishment of a fish hatchery in West Virginia. Signed by the President August 6, 1956 (P. L. 990).

S. 3998, a bill providing for the development of a Federal fish hatchery known as Holden Trout Hatchery at Pittsford, Vt. Signed by the President August 1, 1956 (P. L. 889).

H. R. 11548, a bill to establish a new fish hatchery in the vicinity of Paint Bank, Va. Signed by the President August 3, 1956 (P. L. 972).

H. R. 12438 (Gavin), introduced in the House July 26, a bill to provide for the establishment of a fish hatchery in northwestern part of Pennsylvania; to the Committee on Merchant Marine and Fisheries.

H. R. 12454 (Reuss), introduced in the House July 27, a bill to provide for the establishment of a fish hatchery in

Wisconsin; to the Committee on Merchant Marine and Fisheries.

FISHING VESSEL MARINE INSPECTION: H. R. 9047, a bill for the safety of life and property by making all commercial fishing vessels subject to the rules and regulations of the U. S. Coast Guard Marine Inspection. A subcommittee has been appointed by the House Committee on Merchant Marine and Fisheries to investigate the improvement of small boat safety. The subcommittee was scheduled to visit a number of West Coast ports, starting with hearings at Astoria August 30, 1956. Subsequent hearings were to be scheduled at Tacoma and Seattle, Wash., and California ports.

GREAT LAKES FISHERIES COMMISSION: S. 3524, a bill to give effect to the Convention on Great Lakes Fisheries signed at Washington September 10, 1954, and for other purposes. House passed this bill on May 21 and cleared it for the President. Signed by the President June 4, 1956 (P. L. 557).

House Report No. 2154, Giving Effect to the Convention on Great Lakes Fisheries Signed at Washington September 10, 1954 (May 14, 1956, 84th Congress, 2nd Session) to accompany S. 3524, 10 pp., printed. Discusses the purpose and background of the bill, and presents the statements by various Federal agencies.

INTERIOR DEPARTMENT APPROPRIATIONS: H. R. 9390, fiscal 1957 appropriations for Interior Department and related agencies (including the Fish and Wildlife Service). Signed by the President June 13, 1956 (P. L. 573).

House Report No. 2250, Department of the Interior and related agencies Appropriation Bill, 1957 (May 31, 1956, 84th Congress, 2nd Session), conference report to accompany H. R. 9390, 5 p., printed. Points out the conference agreements.

SEA NETTLES AND JELLYFISH RESEARCH: S. 3955, a bill to authorize research by the Fish and Wildlife Service to determine methods of, and to provide grants to the states to assist approved research or other projects for, control or extermination of sea nettles and jellyfish in marine waters of the United States. Senate Interstate and Foreign Commerce Committee reported the bill to the Senate July 20, 1956, with amendments. Senate passed amended bill July 23, 1956, on call of calendar.

SHELLFISH RESEARCH LABORATORY: S. 3827, a bill to authorize the construction of a shellfish research laboratory and experiment station in the Chesapeake Bay area. Senate Interstate and Foreign Commerce Committee reported the bill to the Senate July 18, with amendments. Senate passed July 23, 1956, amended, on call of the calendar.

SUPPLEMENTARY APPROPRIATIONS: H. R. 12138, a bill making supplemental appropriations for fiscal year 1957 (provides among other things for $620,000 for the Great Lakes Fisheries Commission). Signed by the President July 27, 1956 (P. L. 814).

H. R. 12350, a bill making second supplemental appropriations for the fiscal year ending June 30, 1957, and for other purposes. (Provides among other things for supplemental appropriations for the U. S. Fish and Wildlife Service including an additional amount of $1,250,000 for construction to be available until expended, principally for hatcheries, and initial capital of $10,000,000 for the "Fisheries Loan Fund," a revolving fund for financing and refinancing of operations, maintenance, replacement, repair, and equipment of fishing gear and vessels and for research into the basic problems of fisheries.) Signed by the President July 31, 1956 (P. L. 855).

TARIFFS AND TRADE STUDY: The House Ways and Means Committee has appointed a special Subcommittee on Customs, Tariffs and Reciprocal Trade Agreements "to conduct an investigation and study of all aspects of our customs, tariffs, trade agreements authority and trade agreements entered into thereunder."

The subcommittee announced the latter part of August that its study was scheduled to get under way with two weeks of public hearings beginning September 17.

Chairman of the new subcommittee is Representative Boggs (La.). Other members of the group are Representative King (Calif.), Harrison (Va.), McCarthy (Minn.), Machrowick (Mich.), Reed (N. Y.), Sadlak (Wis.), Curtis (Mo.), and Byrnes (Wis.).

Chairman Boggs announced that the subcommittee desires to obtain "balanced and objective information factually presented on all aspects of our customs and tariff laws and the trade agreements program." The agenda of the subcommittee includes testimony on:

"A. United States Trade Policy and the National Interests. It is expected under this subject to develop basic information on the position of the United States in the world economy, on the significance of trade policy to our domestic economy and to our international objectives, and on the fundamental trade problems and issues confronting the United States;

"B. The pattern of foreign trade. It is expected this subject will develop our current knowledge about the economic forces which cause trade to take place and which influence adjustment in the composition of our imports and exports, including balance of payments and world trade and payments factors;

"C. Foreign trade, trade policies, trade agreements program and related commercial policies and the United States economy. It is expected this topic will develop information on the significance, impact, and effect of imports and exports on the United States economy in its entirety and on the particular segments thereof, including industry, labor, agriculture, and distribution and transportation, in the context of the general national interest."

TRUCK TRIP LEASING: S. 898, a bill to amend the Interstate Commerce Act with respect to the authority of the Interstate Commerce Commission to regulate the use by motor vehicles not owned by them. Signed by the President August 3, 1956 (P. L. 957). Congressman Oren Harris included the following summary of the bill in the July 31 Congressional Record: "Summary of Provisions of Trip-Leasing Legislation, S. 898, 84th Congress.

"The legislation would authorize the Interstate Commerce Commission to exercise certain regulatory control over the leasing of motor vehicles by motor common and contract carriers, when such vehicles are to be driven for the carriers by the owner, or an employee of the owner, of the vehicle. This legislation is not concerned with the leasing of a motor vehicle when such vehicle is leased without the services of a driver.

"The Commission is granted authority by this legislation to prescribe regulations as to certain contents of the lease, and regulation which would assure that the motor carrier

would have full direction and control of the leased vehicle and be fully responsible for its operation. The Commission is also given authority to establish requirements with respect to inspection and the safety of operation of such vehicles.

"However, the Commission is denied authority to regulate the duration of a trip-lease of a motor vehicle, with driver, or the amount of compensation for the use of such vehicle, when the vehicle is that of (1) a farmer, (2) a farmer-cooperative organization or federation, or (3) a for-hire or private carrier when such vehicle has completed a movement of property specified in the agricultural exemptions specified in section 203 (b) (6) of the Interstate Commerce Act. Under this section, motor vehicles used in carrying property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof), are exempted from economic regulation by the Commission, but are subject to its safety regulations.

"In other words, regulated motor common and contract carriers would be permitted to trip lease the motor vehicle, with driver, of a farmer, a farm cooperative association or federation, or the motor vehicle of a for-hire or private carrier which has completed a movement of property specified in section 203 (b) (6) of the act. Also, regulated motor carriers would be permitted to trip lease the motor vehicle of a private carrier when such vehicle is used regularly in the transportation of perishable products manufactured from property specified in section 203 (b) (6). Examples of such perishable products are frozen orange juice, or frozen vegetables.

"The direction of movement of the trip-leased vehicle is limited generally to a single movement or one or more of a series of movements, in the general direction of the general area in which the trip-leased vehicle is based.

"A more detailed statement of this legislation is given in House Report No. 2425, 84th Congress."

FISHERIES RADIO NETWORK IN JAPAN

In Japan there are more than 3,000 radio-equipped fishing boats which together with 77 fisheries radio stations on land, distributed throughout the Japanese islands, form a radio network in the promotion of efficient fishing operations. At present 56 frequencies are allocated to the fisheries radio communication system, distributed according to districts and the type of fisheries. Some of the shore stations are owned by the National Fisheries Research Laboratories, many by prefectural fisheries institutions, and a few by private companies.

The largest radio network in Japan covers the skipjack and tuna fishing fields. It has over 1,000 widely-distributed boats, and all prefectures facing the Pacific Ocean have one to three land stations. Communication with these fisheries is continuous throughout the day on many frequencies, making it possible to know the conditions of the fishing grounds, and location of schools of fish, as well as the position of each boat and to provide prompt action in event of distress. Other functions include arranging for the landing and marketing of the catch and the preparations required for the next voyage. These messages between fishing boats and stations are of a commercial nature, but there is another government network for the guidance of fishing vessels, namely the prefectural land stations which receive information from their fisheries guidance boats which is then broadcast to the commercial fishing fleet. However, the scale of this network is not large at present.

The only systematic analysis of these functions is carried on by the Tohoku Regional Fisheries Research Laboratory under the Fisheries Agency. The oceanographic environments, circumstances of the fishing grounds and other valuable information along the northeastern sea area of the Japanese Pacific coast are sent via the Ishinomaki fisheries radio station, and during peak skipjack and albacore fishing around Izu peninsula, similar information is sent to this area via the Yaizu fisheries radio station. One of the major functions of the Tohoku Laboratory is the research of skipjack fisheries throughout the entire Pacific waters.

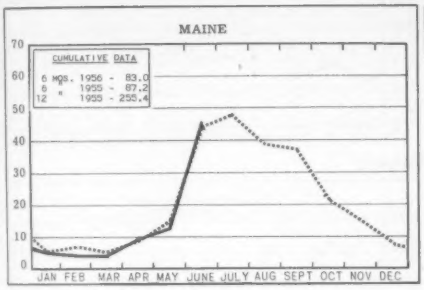
The main work of this fisheries guidance system is to broadcast the synoptic isothermal chart. This is made up from data received daily from many fishing boats and whalers operating in these waters, together with oceanographic data sent from fisheries guidance boats of each prefecture and the marine observation vessels of the various Japanese agencies. Assembled, the results are then broadcast and are interpreted by the fishing vessels which make up their own isothermal charts on board so that they may study and investigate the daily oceanographic environmental conditions.

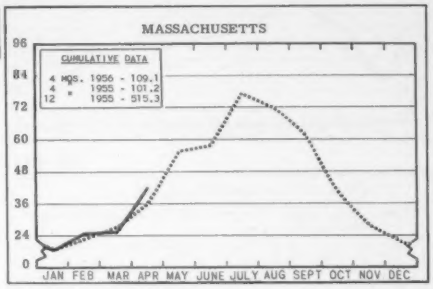
The Tohoku Regional Fisheries Research Laboratory also trains fishermen to plot and interpret the isothermal chart. The fishermen have shown great interest in this study.

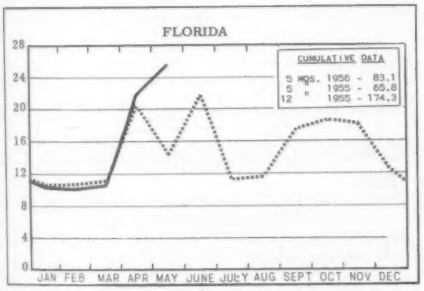
--Indo-Pacific Fisheries Council-FAO, Proceedings 5th Meeting, Bangkok, Thailand (January 22-February 5, 1954).

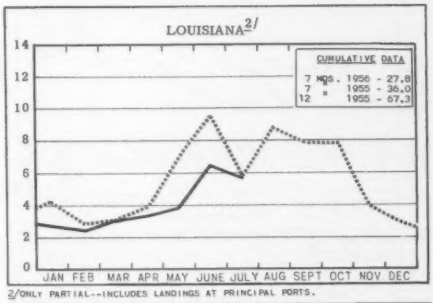
CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

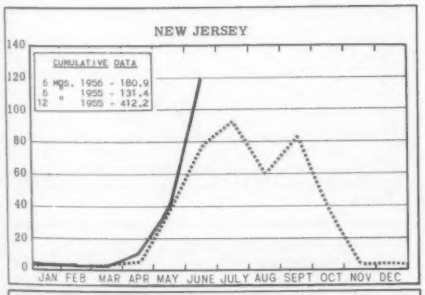


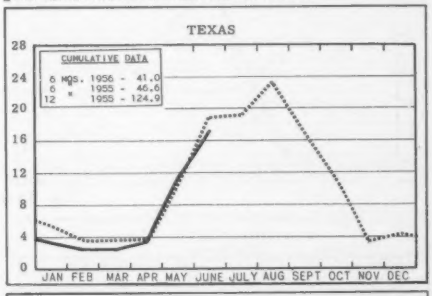


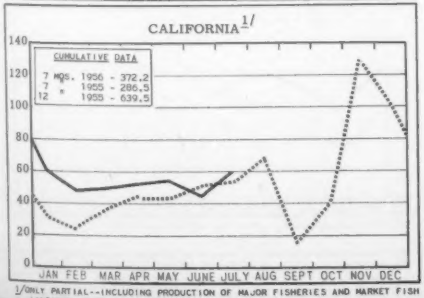




2/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.







1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

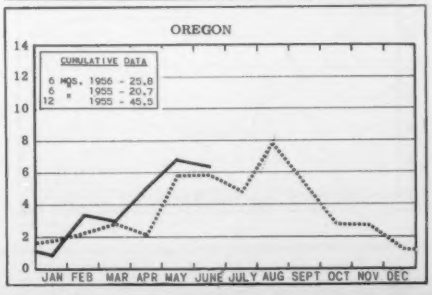
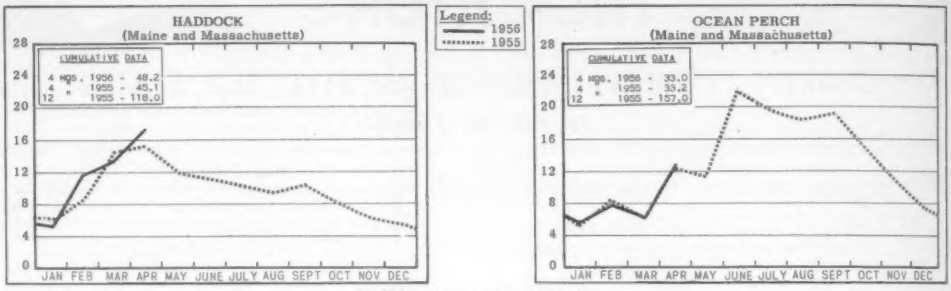
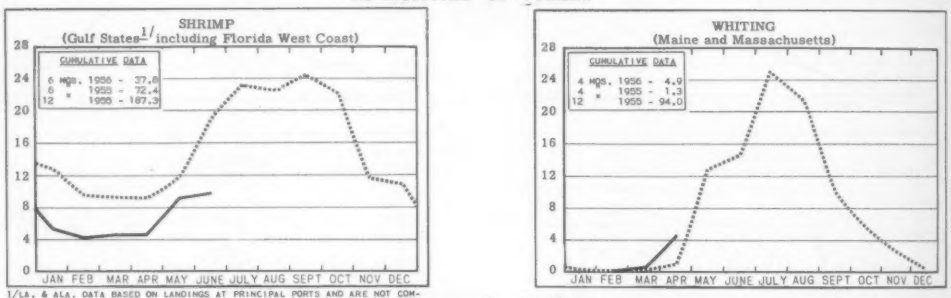


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

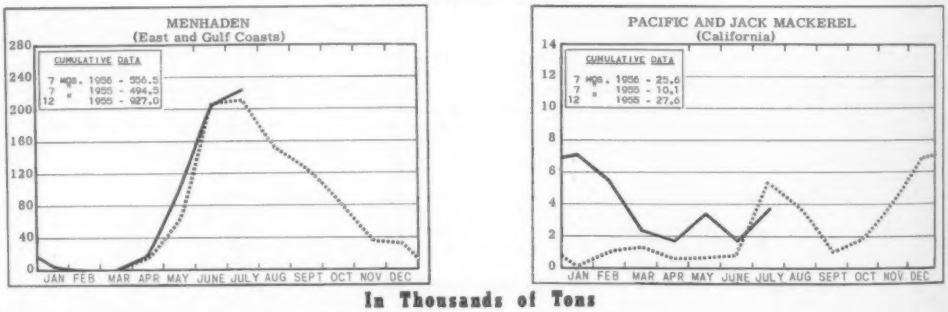


In Millions of Pounds

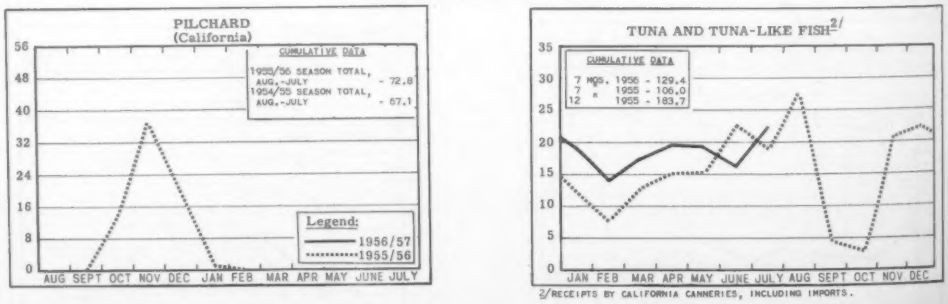

SHRIMP
(Gulf States[1/] including Florida West Coast)
CUMULATIVE DATA
6 MOS. 1956 - 37.8
6 " 1955 - 72.4
12 " 1955 - 187.3
WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
4 MOS. 1956 - 4.9
4 " 1955 - 1.2
12 " 1955 - 94.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
7 MOS. 1956 - 556.5
7 " 1955 - 494.5
12 " 1955 - 927.0
PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
7 MOS. 1956 - 25.6
7 " 1955 - 10.1
12 " 1955 - 27.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

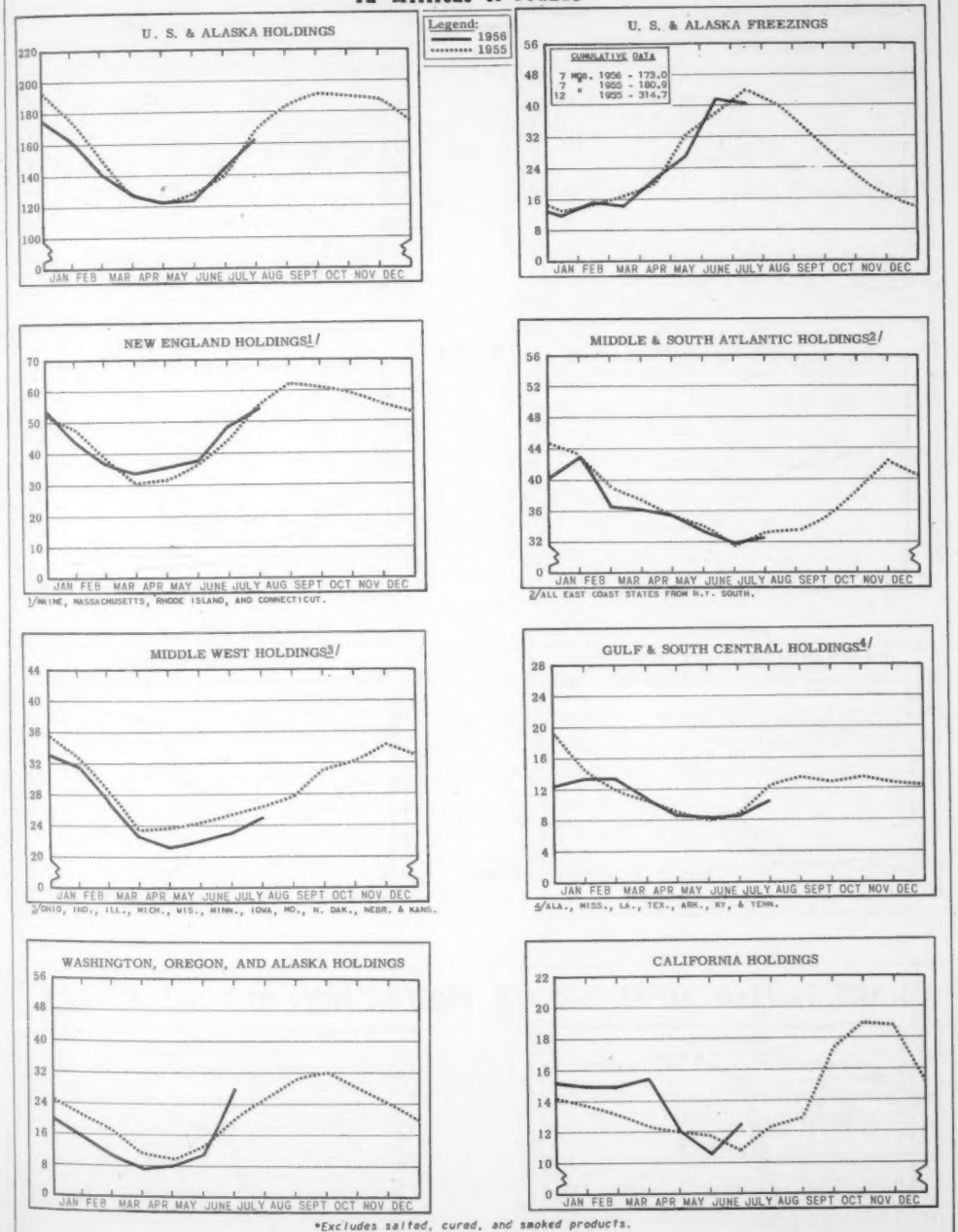
In Thousands of Tons


PILCHARD
(California)
CUMULATIVE DATA
1955/56 SEASON TOTAL, AUG.-JULY - 72.8
1954/55 SEASON TOTAL, AUG.-JULY - 67.1
Legend:
1956/57
1955/56
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY
TUNA AND TUNA-LIKE FISH[2/]
CUMULATIVE DATA
7 MOS. 1956 - 129.4
7 " 1955 - 106.0
12 " 1955 - 183.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
Legend:
1956
1955
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
7 MOS. 1956 - 173.0
7 " 1955 - 180.9
12 " 1955 - 314.7
NEW ENGLAND HOLDINGS1/
MIDDLE & SOUTH ATLANTIC HOLDINGS2/
MIDDLE WEST HOLDINGS3/
GULF & SOUTH CENTRAL HOLDINGS4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.

2/ALL EAST COAST STATES FROM N.Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY, & TENN.

*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

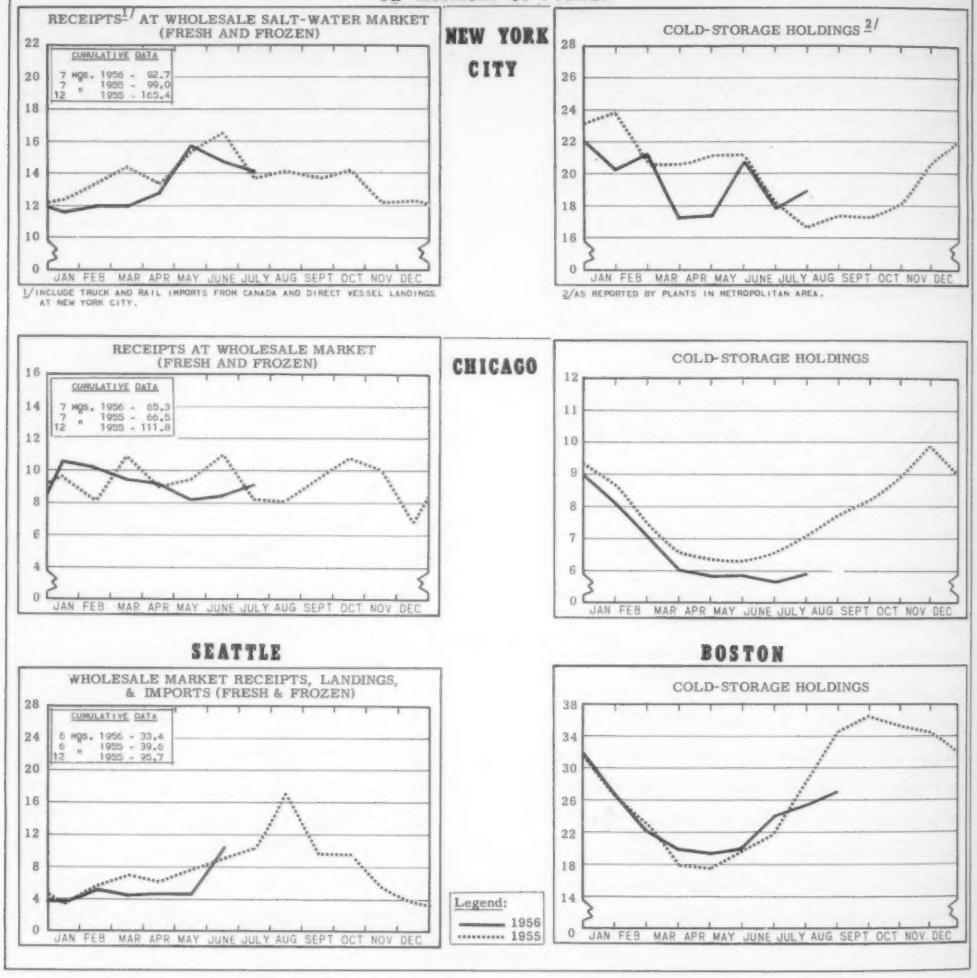

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET (FRESH AND FROZEN)
CUMULATIVE DATA
7 MOS. 1956 - 92.7
7 " 1955 - 99.0
12 " 1955 - 165.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.
NEW YORK CITY
COLD-STORAGE HOLDINGS 2/
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.
RECEIPTS AT WHOLESALE MARKET (FRESH AND FROZEN)
CUMULATIVE DATA
7 MOS. 1956 - 65.3
7 " 1955 - 66.5
12 " 1955 - 111.8
CHICAGO
COLD-STORAGE HOLDINGS
SEATTLE
WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN)
CUMULATIVE DATA
6 MOS. 1956 - 33.4
6 " 1955 - 39.6
12 " 1955 - 95.7
BOSTON
COLD-STORAGE HOLDINGS
Legend:
1956
1955

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

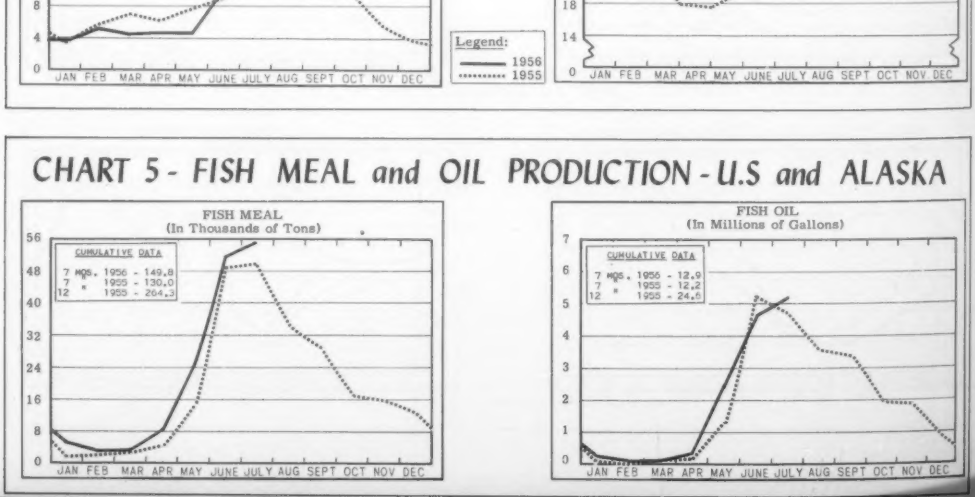
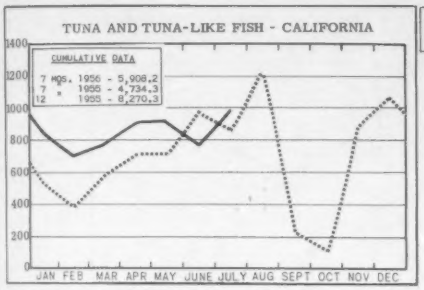
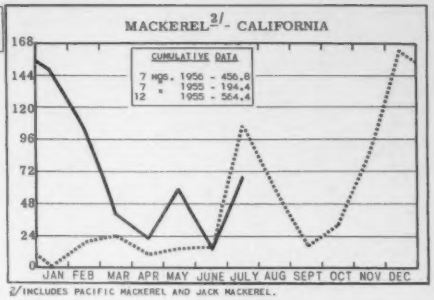

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
7 MOS. 1956 - 149.8
7 " 1955 - 130.0
12 " 1955 - 264.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
7 MOS. 1956 - 12.9
7 " 1955 - 12.2
12 " 1955 - 24.6

CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

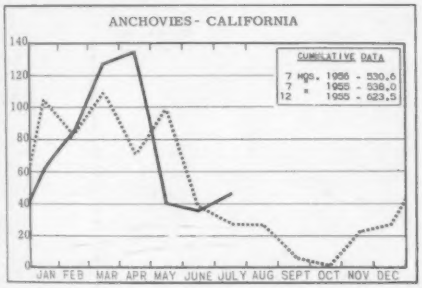
In Thousands of Standard Cases

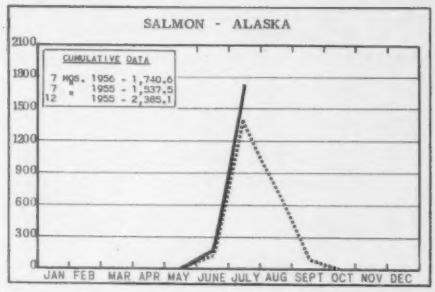

TUNA AND TUNA-LIKE FISH - CALIFORNIA
CUMULATIVE DATA
7 MOS. 1956 - 5,908.2
7 " 1955 - 4,734.3
12 " 1955 - 8,270.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

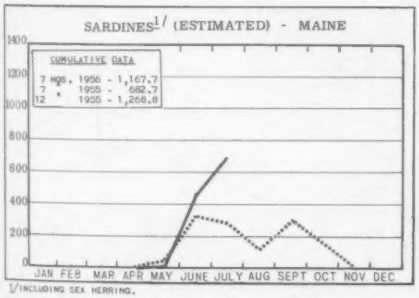
Legend:
1956
1955


MACKEREL 2/ - CALIFORNIA
CUMULATIVE DATA
7 MOS. 1956 - 456.8
7 " 1955 - 194.4
12 " 1955 - 564.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.


ANCHOVIES - CALIFORNIA
CUMULATIVE DATA
7 MOS. 1956 - 530.6
7 " 1955 - 538.0
12 " 1955 - 623.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

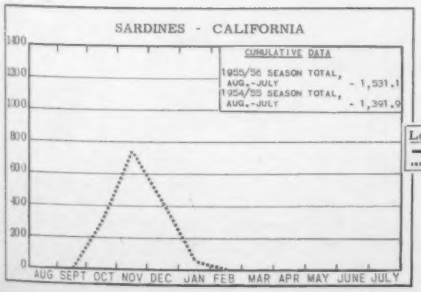



SARDINES 1/ (ESTIMATED) - MAINE
CUMULATIVE DATA
7 MOS. 1956 - 1,167.7
7 " 1955 - 682.7
12 " 1955 - 1,266.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1955/56 SEASON TOTAL, AUG.-JULY - 1,931.1
1954/55 SEASON TOTAL, AUG.-JULY - 1,391.9
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

Legend:
1956/57
1955/56

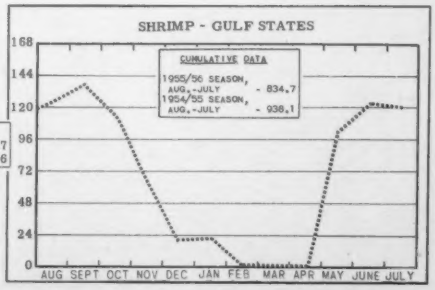
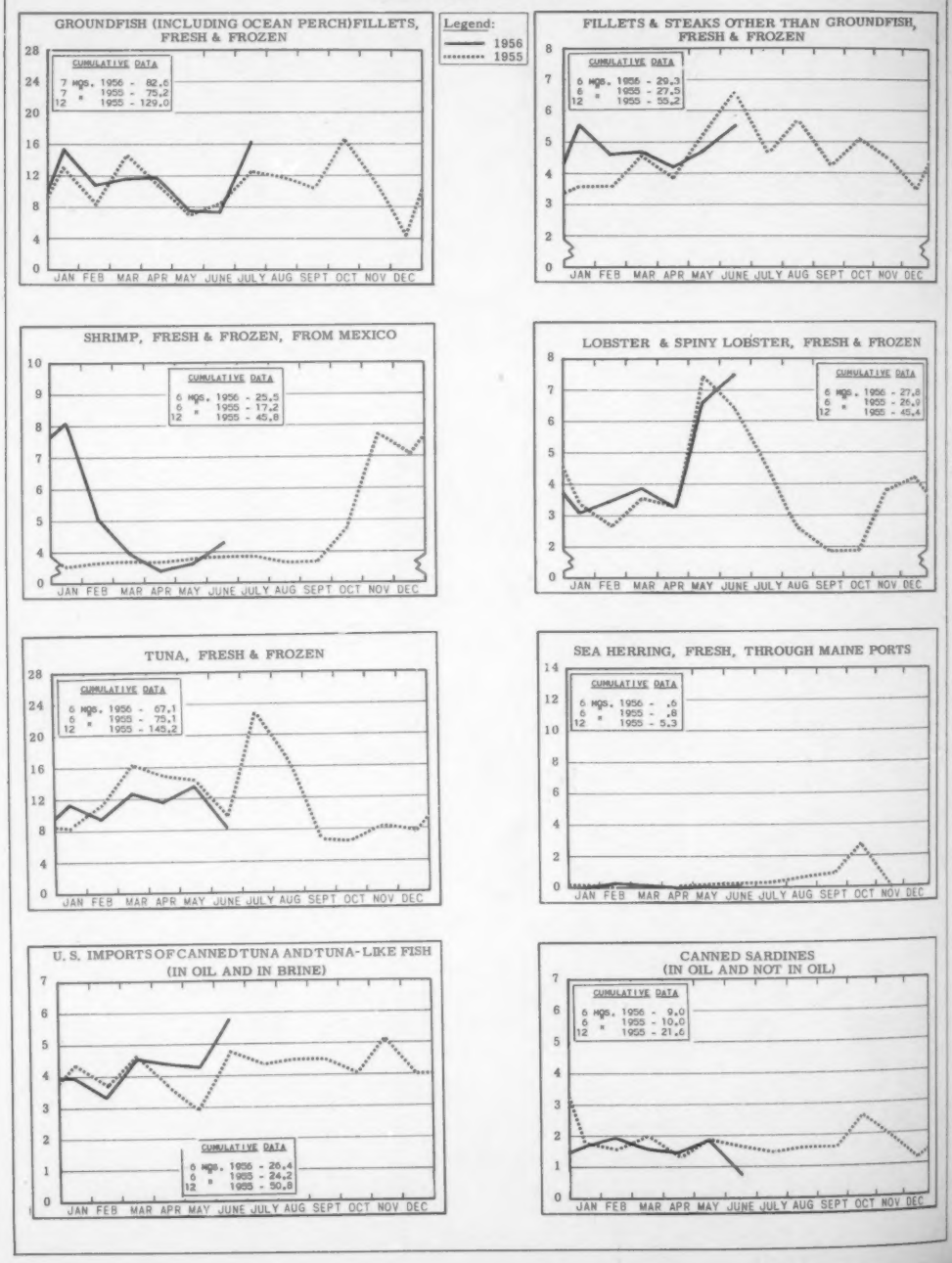
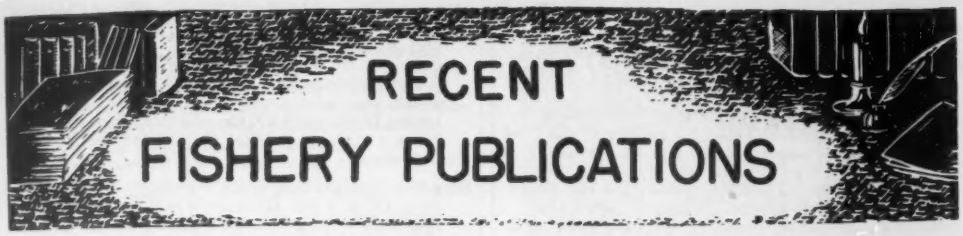

SHRIMP - GULF STATES
CUMULATIVE DATA
1955/56 SEASON, AUG.-JULY - 834.7
1954/55 SEASON, AUG.-JULY - 938.1
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (INCLUDING OCEAN PERCH) FILLETS, FRESH & FROZEN
CUMULATIVE DATA
7 MOS. 1956 - 82.6
7 " 1955 - 75.2
12 " 1955 - 129.0
Legend:
1956
1955
FILLETS & STEAKS OTHER THAN GROUNDFISH, FRESH & FROZEN
CUMULATIVE DATA
6 MOS. 1956 - 29.3
6 " 1955 - 27.5
12 " 1955 - 55.2
SHRIMP, FRESH & FROZEN, FROM MEXICO
CUMULATIVE DATA
6 MOS. 1956 - 25.5
6 " 1955 - 17.2
12 " 1955 - 45.8
LOBSTER & SPINY LOBSTER, FRESH & FROZEN
CUMULATIVE DATA
6 MOS. 1956 - 27.8
6 " 1955 - 26.8
12 " 1955 - 45.4
TUNA, FRESH & FROZEN
CUMULATIVE DATA
6 MOS. 1956 - 67.1
6 " 1955 - 75.1
12 " 1955 - 145.2
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
6 MOS. 1956 - .6
6 " 1955 - .8
12 " 1955 - 5.3
U. S. IMPORTS OF CANNED TUNA AND TUNA-LIKE FISH (IN OIL AND IN BRINE)
CUMULATIVE DATA
6 MOS. 1956 - 26.4
6 " 1955 - 24.2
12 " 1955 - 50.8
CANNED SARDINES (IN OIL AND NOT IN OIL)
CUMULATIVE DATA
6 MOS. 1956 - 9.0
6 " 1955 - 10.0
12 " 1955 - 21.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



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FL - FISHERY LEAFLETS.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1317 - Massachusetts Landings, January 1956, 3 pp.
CFS-1337 - Mississippi River Fisheries, 1954, 6 pp.
CFS-1349 - Shrimp Landings, April 1956, 4 pp.
CFS-1350 - Frozen Fish Report, May 1956, 8 pp.
CFS-1358 - Florida Landings, March 1956, 6 pp.
CFS-1360 - Imports & Exports of Fishery Products, 1951-1955, Annual Summary, 10 pp.
CFS-1361 - Massachusetts Landings, February 1956, 4 pp.
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CFS-1376 - New Jersey Landings, May 1956, 4 pp.
CFS-1377 - Maine Landings, May 1956, 4 pp.
CFS-1378 - Massachusetts Landings, March 1956, 5 pp.
CFS-1379 - Shrimp Landings, May 1956, 4 pp.
CFS-1380 - Fish Stick Report, April-June 1956, 2 pp.
CFS-1381 - Ohio Landings, June 1956, 2 pp.
CFS-1383 - Alabama Landings, May 1956, 2 pp.
CFS-1384 - Fish Meal and Oil, June 1956, 2 pp.
CFS-1392 - Mississippi Landings, May 1956, 2 pp.
FL - 435 - Major Commercial Fisheries with Data on Research Expenditures, 22 pp.
FL - 436 - Commercial Possibilities and Limitations in Frog Raising, 4 pp.

Wholesale Dealers in Fishery Products (Revised):
SL - 13 - North Carolina, 1956, 6 pp.
SL - 14 - South Carolina, 1956, 2 pp.
SL - 20 - Texas, 1956, 3 pp.

Firms Canning (Revised):
SL - 101 - Salmon, 1955, 3 pp.
SL - 106 - Shad or Shad Roe, 1955, 1 p.
SL - 107 - Fish and Shellfish Specialties, 1955, 7 pp.
SL - 109 - Caviar and Fish Roe, 1955, 2 pp.
SL - 110 - Oysters, 1955, 2 pp.
SL - 111 - Clam Products, 1955, 2 pp.
SL - 113 - Crab Meat, 1955, 2 pp.
SL - 116 - Food for Animals, from Marine-Animal Products, 1955, 2 pp.
SL - 118 - Groundfish Flakes, 1955, 1 p.

Firms Manufacturing (Revised):
SL - 151 - Fish Meal, Scrap, Body & Liver Oils, 1955, 8 pp.
SL - 152 - Oyster Shell Products, 1955, 2 pp.
SL - 153 - Fish Glue and Isinglass, 1955, 1 p.
SL - 154 - Seaweed Products, 1955, 1 p.
SL - 155 - Marine Pearl Shell Buttons, 1955, 1 p.
SL - 156 - Pearl Essence, 1955, 1 p.
SL - 159 - Fresh-Water Mussel-Shell Products, 1955, 1 p.
SL - 160 - Menhaden Oil and Meal, 1955, 1 p.

SSR-Fish. No. 175 - Sea Lamprey Control on the Great Lakes, 1953 and 1954, by Leo F. Erkkila, Bernard R. Smith, and Alberton L. McLain, 30 pp., illus., processed, May 1956. Development of electromechanical devices permitted practical application of sea-lamprey control in Great Lakes streams. The barriers were energized by 110-volt, 60-cycle, alternating current. Sea lampreys were effectively blocked in their upstream spawning migration. Traps were installed in the control structures to pass migratory fish upstream. The extent of fish mortality at the electrical barriers was influenced by stream velocities, conductivity of the water and stream bottom, and size and location of the traps. Biological data on the sea lampreys were collected at the control structures. Each stream appeared to have its own electrical characteristics. Several factors influencing the electrical fields were determined. Present information indicates limited possibility of improving the electrical field to reduce fish mortality.

Sep. No. 444 - New Products from Fish Oils, Part I - Introduction.
Sep. No. 445 - "Brown-Spotting" in the Southern Oyster.
Sep. No. 446 - Fishery Tariff Concessions in 1956 Geneva Negotiations.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fisheries Trends and Review for 1954, by V. J. Samson, 33 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) This is a review of the 1954 trends and conditions in the California fisheries. Among the subjects discussed are the tuna fishery (cannery receipts, total pack for 1945-1954, ex-vessel prices, domestic catch and fishing conditions, imports of frozen tuna, and canned tuna market conditions and price quotations); California sardine (pilchard) fishery (landings, ex-vessel prices, canned pack, and canned sardine prices); mackerel fishery (cannery receipts and ex-vessel prices); anchovy fishery; and imports of fishery products. Included in the statistical tables are data on tuna receipts and canned pack by months and species; landings and products of sardines (pilchards) by months, products, and areas; landings and pack of mackerel and jack mackerel by species and months; production of miscellaneous fishery products; freezings of fish and shellfish; cold-storage holdings; landings of market fish and shellfish at certain California ports; and imports of fishery products into California and Arizona.

Boston Fishery Products Monthly Summary, May 1956, 15 pp.; Boston Fishery Products Monthly Summary, June 1956, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to primary wholesalers; for the months indicated.

(New York) Monthly Summary - May 1956 - Receipts of Fishery Products at the New York City Wholesale Salt-Water Market, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, June 1956, 4 pp. (Market News Service, 18 S. King St., Hampton, Va.) Fishery production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, June 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans, and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

(Chicago) May 1956 Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Prices, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.

(Seattle) Monthly Summary - Fishery Products, June 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Termial, Seattle 1, Wash.) Includes landings and local receipts as reported by Seattle and Astoria (Oregon) wholesale dealers.

California Fishery Products Monthly Summary, June 1956, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, and squid; pack of canned tuna, mackerel, herring, anchovies, and squid; market fish receipts at San Pedro.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Raising Bait Fishes, by John Dobie, O. Lloyd Meehean, S. F. Snieszko, and George N. Washburn, Circular 35, 127 pp., illus., printed, 45 cents, 1956. At the second annual meeting of the Tri-State Fisheries Conference (Michigan, Minnesota, and Wisconsin) in 1946, a special committee was appointed to assemble information on bait culture and to assign research to the contributing agencies. In 1948, the results of that cooperative project were published in Circular 12, Propagation of Minnows and Other Bait Species. The present publication is a revision of Circular 12 and adds the results of 5 years of pond investigations by research men in the Midwestern States. It presents information on the culture of bait fishes and is intended as a guide for those interested in commercial propagation of minnows.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

"Absorption of Salt by Whole Crays in Cooking," by K. W. Anderson, article, Fisheries Newsletter, vol. 15, no. 5, May 1956, pp. 15, 19, printed. Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia. Experiments, the results of which are given in this paper, were carried out at the C.S.I.R.O. Tasmanian Regional Laboratory at Hobart to obtain quantitative data on the absorption of salt by the meat of crayfish cooked in salt brines. The results show that the tail meat absorbed very little salt even in the concentrated

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solutions; meat more than $\frac{3}{8}$ in. below the surface did not absorb salt until the brine strength was increased beyond 10 percent. There was a slight loss of natural salt by leaching on cooking in fresh water, but only from the surface layer. Leg meat absorbed small amounts of salt in brines of low strength and about 1.5 percent in the most concentrated solution.

American Nautical Almanac for the Year 1957, 294 pp., printed, $2. Nautical Almanac Office, U. S. Naval Observatory, Washington, D. C., 1956. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C.) The object of this volume is to provide in convenient form the astronomical data required by mariners; that is, the Greenwich hour angle and declination of the celestial bodies used in navigation.

The Art of the Aqualung, by Robert Gruss, translated by Richard Garnett, 66 pp., illus., printed, $2.75. Philosophical Library, 15 East 40th St., New York 16, N.Y., 1956. This book is not intended to be a manual for the expert diver, but it gives an outline of the way the aqualung is used in the sea, and of the elementary rules of safety which every diver is obliged to obey. It originally dealt only with diving on the French Riviera, where aqualung diving was born, and where it has been much developed since 1946. It supplies all the information and instruction that the beginner requires to swim and fish and explore, and it will also protect him against the dangers of the game. The translator has added for the English edition some information about British equipment and diving practice.

"Arctic and Sub-Arctic Marine Resources," by John Corlett, article, FAO Fisheries Bulletin, vol. IX, no. 2, April-June 1956, pp. 63-78, printed. Food and Agriculture Organization of the United Nations, Rome, Italy.

Australian Journal of Marine and Freshwater Research, vol. 7, no. 1, April 1956, 194 pp., illus., printed, single copy 7s. 6d. (85 U. S. cents). Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne, C. 2, Victoria. Includes two articles on bluefin tuna: (1) "The Southern Bluefin Tuna, Thunnus thynnus maccoyii (Castelnau), in Australian Waters," by D. L. Serventy. This paper deals with the results of the investigations of the Division of Fisheries, C.S.I.R.O., into the biology of the southern bluefin tuna, a representative in southern Australia and New Zealand of the tunny of Europe and the bluefin tuna of California. A comparative description of the morphology of the Australian form is given with a detailed study of its occurrence in Australia, including a discussion of the possible presence of local breeding stocks. The growth rate is considered from a study of length-frequency data. Considerable variations have been found in the growth rate of the younger age classes, as well as fluctuations in their relative abundance and their migratory movements along the eastern Australian coastline. Reference is made to the feeding habits in various areas. (2) "Additional Observations on the Biology of the Northern Bluefin Tuna, Kishinoella tonggol (Bleeker), in Australia," by D. L. Serventy. This paper describes the northern bluefin tuna which occurs along the whole of the north coast of Australia and on the east and west coasts far south as Twofold Bay, N.S.W., and Cockburn Sound, W.A., respectively. Fin formulae, scale row and gill-raker data, and morphometrical characters are recorded separately for fish of the northern, eastern, and western regions. Marked regional differences occur; but it is considered that these can be largely (though not entirely) explained by differential growth of body parts, since only small sizes are found in the extreme north whereas large sizes predominate in the southern portions of the range. The hypothesis of two distinct species, suggested by size group distribution and regional variations, is rejected. Sexual maturity in K. tonggol is reached in the third year of life and spawning is in the summer. The species apparently feeds mainly on pelagic organisms. The Journal also includes the following articles: "The Marine Algae of Kangaroo Island. IV. The Algal Ecology of American River Inlet," by H. B. S. Womersley; "The Ecology and Distribution of Intertidal Organisms on the Rocky Shores of the Queensland Mainland," by R. Endean, R. Kenny, and W. Stephenson; "A Portable Recording Tide Gauge," by E. P. Hodgkin; "The Family Cerithiopsidae (Mollusca) from the Solanderian and Dampierian Zoogeographical Provinces," by C. F. Laseron; and "Additional Microplankton from Australian Late Mesozoic and Tertiary Sediments," by Isabel C. Cookson.

The Behavior of Pink Grooved Shrimp, PENAEUS DUORARUM Burkenroad, in a Direct Current Electrical Field, by James B. Higman, Technical Series No. 16, 25 pp., illus., printed. State Board of Conservation, Tallahassee, Fla., March 1956. A report of an investigation, undertaken by the Marine Laboratory of the University of Miami on behalf of the Florida State Board of Conservation, to determine whether pink-grooved shrimp could be forced to move involuntarily to the positive pole in a field of pulsed direct current. "If such forced movement of shrimp were possible," states the author, "the 'bad bottom' areas of the west coast of Florida might be opened to commercial shrimping. This area is at present only partially exploited due to widespread coral growths and large sponge beds which restrict trawling. A net designed to fish above these bottom obstructions could be electrified so that shrimp would be diverted into the path of the net. In this manner, areas previously unsuited to trawling would become accessible. Experiments conducted in a tank containing sea water showed that pink-grooved shrimp flipped backward toward the positive electrode when subjected to an electrical field of pulsed direct current. Series of tests were made to determine the optimal electrical conditions that would cause maximum movement to the posi-

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tive electrode. Maximum response was 87 percent when these optima were used: (1) a current density of 15 milliamperes per square inch; (2) a pulse rate of 5 per second; and (3) a current ratio of 1:3. (Mathematical treatment of the results indicates that the maximum response would be obtained by using a 1:2 current ratio with the same pulse rate and current density.) Using these optimal values, calculations of the power needed to electrify a 74-foot shrimp trawl showed that the size and the cost of the required electrical generator would be economically impractical. A method of pulsing current by battery or condenser discharge might conceivably reduce the capacity of the generator to a practical size. This problem, however, requires further investigation."

Berichte der Deutschen Wissenschaftlichen Kommission fur Meeresforschung (Reports of German Scientific Commissions for Study of the Ocean), New Sequence, vol. XIV, no. 2, pp. 83-164, illus., printed in German with brief summaries in English. E. Schweizerbart'sche Verlagsbuchhandlung (Nagele u. Obermiller), Stuttgart, Germany, 1956. Contains the following papers: "Die Deutschen Schollenuntersuchungen von 1948-1954" (The German Studies on Flounders, 1948-1954), by Adolf Kotthaus; "Uber das Verhalten des Oberflachensalzgehaltes in der Deutschen Bucht Wahrend der Jahre 1873-1944 in Verbindung mit Langjahrigen Salzgehaltsreihen der Sudlichen Nordsee" (On the Salt Content of the Surface Waters in the German Bay during 1873-1944, compared with the Long Term Series on Salt Content of the Waters in the Southern Part of the North Sea), by Erich Goedecke; and "Uber den Transport von Meroplanktischen Larven aus dem Kattegat in die Kieler Bucht" (On the Transport of the Meroplanktonic Larvae from the Kattegat into the Bay of Kiel), by Karl Banse.

Black Sea Sprat, SPRATTUS SPRATTUS SULINUS (Antipa), by S. A. Stolanov, Bulletin of the Academy of Science No. 3, 92 pp., illus., printed in Bulgarian, 8LV (US$1.20). Institute of Zoology, Sofia, Bulgaria, 1953.

Blood Sugar in Spiny Lobsters, Part I of the Hormonal Regulation of Metabolism in Crustaceans, by Bradley T. Scheer and Marlin Ann Ray Scheer, Contribution no. 11, 12 p., illus., printed. (Reprinted from Physiologia Comparata et Oecologia, an International Journal of Comparative Physiology and Ecology, vol. II, no. 3, 1951, pp. 198-209.) Department of Zoology and Entomology, University of Hawaii, Honolulu, Hawaii.

Boletim da Pesca, vol. X, no. 51, June 1956, 91 pp., illus., printed in Portugese. Gabinete de Estudos das Pescas, 211 Avenida da Liberdade, Lisbon, Portugal. Contains, among others the following articles: "A Comissao Internacional das Pescarias do Noroeste do Atlantico e a Comparticipacao de Portugal" (The International Northwest Fisheries Commission and Participation of Portugal); "Alguns Problemas da Industria da Pesca de Benguela" (Some Problems of the Fishing Industry of Benguela).

Bulletin of Tokai Regional Fisheries Research Laboratory (Fisheries Agency), no. 11 (Contribution B), September 1955, illus., printed in Japanese and English. Tokai Regional Fisheries Research Laboratory, Tsukishima, Tokyo, Japan. A collection of reprints covering the following subjects: marine resources; oceanography; marine propagation; fishing gear and methods; chemistry of aquatic products; and utilization of aquatic products, such as food preservation and processing, and fish oils and vitamins.

(Canada) "B. C. Shrimp Fishery," article, Trade News, vol. 8, no. 12, June 1956, pp. 3-4, illus., printed. Department of Fisheries, Ottawa, Canada. Although it is relatively small among British Columbia's fisheries, shrimping is one of the most continuous operations on the Pacific coast. Shrimp fishermen are out, along some part of the coast, every month of the year. There is a steady yield of shrimps in southern B. C. waters, particularly in the Gulf of Georgia and Howe Sound, with a peak period in February and a low one in November. This article describes the type of boat and operation of the gear used in the B. C. shrimp fishery.

(Canada) Regulations Respecting the Construction and Inspection of Fishing Vessels not Exceeding Eighty Feet Registered Length, 38 pp. illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1956. These regulations, issued by the Department of Transport, were made pursuant to section 410 of the Canada Shipping Act by Order in Council P. C. 1956-150 of January 25th, 1956, and amended by Order in Council P.C. 1956-621 of April 19th, 1956. These regulations may be cited as the small fishing vessel inspection regulations. Part I on fishing vessels exceeding 15 tons, gross tonnage, covers application, submission of plans, bilge pumping arrangements, fuel tanks, exhaust pipes, underwater fittings, stern bearings, rudder stocks, shafting, construction of hulls, life-saving equipment, fire-extinguishing equipment, lights and signals, navigating equipment, anchors and cables, first inspection of new construction, and periodic inspection. Part II on fishing vessels not exceeding 15 tons, gross tonnage, covers application, life-saving equipment, fire-extinguishing equipment, precautions against fire, and periodic inspection. Appendix I shows methods of attaching sea connections to wooden hulls, and Appendix II covers regulations respecting liquefied petroleum gas systems for cooking and heating in ships as applicable to vessels not exceeding 80 feet in length.

(Canada) Summary Statistics of Canada's Fisheries, 1935-1954 (Plus Review of Statistics by Areas for 30 Years, 1925-1954), 32 pp., printed. (Reprinted from Canadian Fisheries Annual, 1956, pp. 65-96.) Department of Fisheries, Ottawa, Canada. Statistics are given for quantities and value of Canadian fishery products by areas for 1934-1948; value of gear and craft; number of fishermen; landings and value of East Coast fisheries and fresh-water

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fisheries by provinces and species, and West Coast fisheries by species; and fresh and frozen fillet production. Imports and exports of fishery products, 1952-1955, by products and countries are given. Also included is a directory of fishery products by type, such as fresh and frozen fish (whole or dressed), fresh and frozen fish (filleted), smoked fish (dressed or filleted), cured fish, canned fish (not including shellfish), shellfish (in shell or meat--not canned), canned shellfish, fish oils and fish livers, fish meal, and other fishery products. Listed under each classification are the companies which process that particular product.

(Canada) Summary Analysis of the Fishing Operations of Small and Medium-Sized Modern Long-Liners and Draggers in the Atlantic Provinces, 1955, by John Proskie, Production Studies vol. 5, part 2, 58 pp., illus., processed. Markets and Economics Service, Department of Fisheries, Ottawa, Canada, May 1956. The results of an analysis of the operating accounts of 136 fishing craft at ports on the Atlantic Coast during the 1955 season are summarized and tabulated. The data are grouped according to type of craft and size-class and give information on (1) description of boats, capital costs, financing, ownership; (2) fishing activities; (3) landings and landed values; (4) prices, receipts, expenditures, net returns; (5) fishing effort and returns; (6) geographic operational areas; and (7) seasonal fishing effort and landings. These tables from the 2nd part of vol. 5 of the present series; part 1, a discussion of some of the important points emerging from this study, has not yet been released.

Clupeidae, by A. N. Svetovidov, Fauna of the U.S.S.R. New Series No. 48, vol. II, no. 1, printed in Russian. Zoological Institute of Academy of Science of U.S.S.R., Moscow, Russia, 1952.

Commercial Fishworm Production, by H. S. Swingle, Progress Report Series No. 62, 3 pp., printed. Agricultural Experiment Station, The Alabama Polytechnic Institute, Auburn, Ala., March 1956. Discusses the commercial production of fishworms, with instructions on the construction and management of worm beds, preparation of feed mixtures, methods of raising worms, and pests of worm beds.

Complete List of Lights and Other Marine Aids, Atlantic Coast of the United States, vols. 1-6, 927 pp., illus., printed, $4.75. U. S. Coast Guard, Treasury Department, Washington, D.C., 1956. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D.C.) Lights and other marine aids to navigation maintained by or under authority of the United States Coast Guard on the Atlantic and Gulf Coasts of the United States, including the United States West Indies. This list is intended to furnish more complete information concerning aids to navigation than can be conveniently shown on charts. They are not intended to be used in navigation in the place of charts and coast pilots and should not be so used. The charts should be consulted for the location of all aids to navigation.

"The Conservation and Future Development of West Marine Resources," by Richard Van Cleve, article, Proceedings of the California Academy of Sciences, Fourth Series, vol. XXVIII, no. 12, pp. 425-439, February 17, 1956, printed. California Academy of Sciences, San Francisco, Calif. (Also Contribution No. 12, University of Washington, School of Fisheries, Seattle, Wash.) According to the author, "Prospects are bright for obtaining a considerable increase in production of fish from the sea but the need for preserving the productive capacity of our currently heavily-exploited stocks must not be forgotten. The combined efforts of fisheries biologists, hydrographers, and marine biologists should result in the development of potentially large oceanic fisheries but considerable technical improvements will be required to enable our fishermen to operate economically on these widely-scattered stocks. On the other hand, the development of adequate markets and more advanced and efficient marketing methods should result in the development of a large fishery along the west coast of North America on stocks which are essentially not now utilized. The best use of this fishing region requires some new means of using many species that cannot now be marketed. With the full development of our West Coast fisheries it will be necessary to anticipate the need to develop conservation measures along such lines as have been proven so effective by the International Pacific Halibut Commission in their rehabilitation of the north Pacific halibut stocks. The maintenance of our anadromous fish runs will involve the solution of the many problems encountered in handling upstream as well as downstream migrants at dams. Some means will also have to be found to compensate for spawning and rearing areas that will be, or have already been lost by flooding or by closing them to salmon by obstructive dams. Opening new streams by laddering impassable natural barriers and developing more efficient techniques of artificial propagation are both supplementing efforts to preserve the original salmon spawning grounds. Conservation measures similar to those used so effectively by the International Pacific Salmon Fisheries Commission can insure continued productivity of our salmon, provided the fresh-water environment can be preserved. Finally, settlement of the widely divergent views on ownership of deep-sea fisheries must be reached if their development and conservation are to be successfully accomplished. Treaties appear to be the best means devised so far to protect and develop our fisheries through the cooperative effort of interested nations."

De Duitse Zeevisserij (German Sea Fishing), by A. G. U. Hildebrandt with the collaboration of W. H. Th. Gieling, Report No. 215, 76 pp., illus., printed in Dutch with summary in English. Landbouw-Economisch Institut, The Hague, Netherlands, 1954.

Definitions and Methods of Measuring and Counting in the Billfishes (Istiophoridae, xiphiidae), by Luis Rene Rivas, Contribution No. 149, 10 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 6,

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no. 1, March 1956, pp. 18-27.) Marine Laboratory, University of Miami, Coral Gables, Fla.

A Device for Measuring Fish, by Robert W. Hiatt and Christopher J. Hamre, Research Paper No. 1, 3 pp., illus., printed. (Reprinted from The Journal of Wildlife Management, vol. 9, no. 1, January 1945, pp. 79-81.) Department of Zoology and Entomology, University of Hawaii, Honolulu, Hawaii.

"The Devilfish," by Robert J. Kemp, Jr., article, Texas Game and Fish, vol. XIV, no. 5, May 1956, pp. 8, 30, illus., printed, single copy 20 cents. State Game and Fish Commission, Walton Bldg., Austin, Texas.

The Distribution of Eggs and Larvae of the Anchovy, STOLEPHORUS PURPUREUS Fowler, in Kaneohe Bay, Oahu, with a Consideration of the Sampling Problem, by Albert L. Tester, Contribution No. 12, 26 pp., illus., printed. (Reprinted from Pacific Science, vol. V, no. 4, October 1951, pp. 321-346.) Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii.

"Don't Blacklist Ocean Fish," by Arnold Polonsky, article, The Black Fox Magazine and Modern Mink Breeder, vol. 40, no. 1, May 1956, pp. 9, 21-25, printed, single copy 35 cents. Hoffman Publications, Inc., 425 Fourth Ave., New York 16, N.Y. Discusses the handling, preservation, and utilization of fish for feeding mink. The author gives a few simple rules for utilizing fish in the feeding of mink as follows: "(1) Do not feed one variety of fish in any greater quantity than 15 percent of your ration; (2) Exercise the greatest amount of care in buying only from the best sources. The difference between a good product and a poor product may only represent a $\frac{1}{4}$ of a cent a pound, but that small amount helps the good producer stay interested in the business and making the best product; and (3) When feeding a high fish diet use meat sources that are heavier in fat or even supplement with additional fats such as lard. Carefully consider the varieties of fish that you will use. There are many combinations. Buy one type of fish in a package or block at a time and do your own blending just as you would with horsemeat, liver, lungs, tripe, etc."

(East Pakistan) Fish Markets of East Pakistan and the Question of their Improvement, by Nazir Ahmad, 16 pp., illus., printed. Directorate of of Fisheries, Government of East Bengal, Dacca, East Bengal, 1956. Describes a survey of the fish markets of East Pakistan, and includes suggestions for their improvement.

"Effectiveness of Aureomycin on Keeping Quality of Sardine," by T. Tomiyama, M. Nomura and S. Kuroki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 21, 1955, pp. 262-266, printed in Japanese with summary in English. Japanese Society of Scientific Fisheries, c/o Tokaiku Suisan Kenkyujo, Tsukishima, Kyobashi, Tokyo, Japan.

"The Effects of Temperature and Predators on the Abundance of the Soft-Shell Clam, Mya Arenaria, in New England," by John B. Glude, article, Transactions of the American Fisheries Society, 1954, vol. 84, pp. 13-26, printed. American Fisheries Society, Colorado A and M College, Fort Collins, Colo.

"Exploratory and Experimental Fishing," by S. J. Holt, article, FAO Fisheries Bulletin, vol. IX, no. 1, January-March 1956, pp. 1-22, printed. Food and Agriculture Organization of the United Nations, Rome, Italy.

The Expressible Fluid of Fish Fillets. IV.--The Expressible Fluid of Iced Cod, by A. Banks, DSIR Food Investigation Memoir No. 958, 4 pp., printed. (Reprinted from Journal of the Science of Food and Agriculture, vol. 6, no. 10, 1955, pp. 584-587.) Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland. A number of estimations have been made of the amount and composition of the expressible fluid obtained from gutted cod iced for various periods. The amount of expressible fluid increased rapidly as the fish passed out of rigor mortis and then only slowly for a period, followed by a further fairly rapid increase after 168 hours on ice. It is suggested that the values obtained are associated with the physical changes in texture that occur during the gradual resolution of rigor mortis and with subsequent slight changes in texture and in the colloidal proteins of the protoplasm. The amount of expressible fluid obtained does not appear to be related to the size of the fillets.

"Fertile Oysters May Bring New Industry," article, South Carolina Wildlife, vol. 3, no. 2, Spring Issue 1956, pp. 11, 15, illus., printed. South Carolina Wildlife Resources Department, Columbia, S. C. Discusses the fertility of the South Carolina oysters, the threats to the oyster industry in that area, and the studies being conducted for the proper development of the oyster industry.

Fertilizers in Fish Ponds, by C. H. Mortimer, Fishery Publication No. 5, 155 pp., illus., printed, 25s. (US$3.50). H. M. Stationery Office, York House, Kingsway, London, W.C. 2, England, 1954.

Fish Cookery, by Linnea C. Dennett, Circular 403, 12 pp., illus., printed. Agricultural Extension Service, College of Agriculture, University of Wisconsin, Madison, Wis., revised November 1955. Includes instructions for buying fresh fish; methods of cleaning, skinning, boning, and storing fish, and thawing frozen fish; and various recipes for cooking fish and shellfish.

"The Fisheries of Antarctica," by G. C. L. Bertram and J. D. M. Blyth, article, FAO Fisheries Bulletin, vol. IX, no. 2, April-June 1956, pp. 79-84, illus., printed, single copy 30 cents. Food and Agriculture Organization of the United Nations, Rome, Italy. (Also for sale by

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Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.)

"Fish, Fisheries and Environmental Factors," by J. N. Carruthers, article, Oceanus, vol. IV, no. 2, Winter 1956, pp. 14-20, illus., printed. Woods Hole Oceanographic Institution, Woods Hole, Mass. Some of the author's views in regard to the climatic and oceanographic factors influencing the environment of fish. According to the author, "Fish catches may be predicted through a knowledge of wind conditions during and after spawning."

Fisheries Newsletter, vol. 15, no. 2, February 1956, 24 pp., illus., printed. Commonwealth Fisheries Office, Dept. of Primary Industry, Canberra, Australia. The entire issue of this Newsletter is devoted to articles on shrimp (prawns), covering the biology, technology, and economics of the industry: "Australian Prawns--Identification and Biology," by W. Dall; "Australian Prawns--The Gear that Takes Them," by A. O'Grady; "Australian Prawns--The Broad View on Exports," by F. J. Kearns; and "Shrimp Big Industry in U. S. A." The latter paper is an account of the United States shrimp industry based mainly on "Marketing and Utilization of Shrimp in the United States," a paper prepared for the Indo-Pacific Fisheries Council meeting in Tokyo by Don M. Clifford of the U. S. Fish and Wildlife Service.

Fish Handling and Hold Construction in Canadian North Atlantic Trawlers, by W. A. MacCallum, Bulletin No. 103, 66 pp., illus., printed. Fisheries Research Board of Canada, Ottawa, Canada, 1955. This bulletin is concerned mainly with the handling of the catch aboard trawlers fishing North Atlantic groundfish, principally cod, haddock, and flatfish. The quality of the landed fish is influenced by the methods of handling the catch on deck and in the fish hold and the conditions of stowage. No subsequent steps in the processing chain can improve upon this landed quality. This bulletin is intended to assist fishermen, boat owners, operators, and processors to understand the nature of the complex problem of preservation at sea, to demonstrate proper methods of handling, and to describe fish-hold construction suited for the iced stowage of their catches. The various chapters discuss spoilage and its control aboardship; ice and refrigeration requirements in trawler fish holds; the development of metal-surfaced, wholly refrigerated fish holds; good practice in fish-hold construction, outfitting, and refrigeration; and fish-room costs.

Fisken og Havet ved Gronland (Fish and the Sea of Greenland), by P. M. Hansen and F. Hermann, Skrifter fra Danmarks Fiskeri-og Havunder Sogelser (Papers of the Danish Fishery and Sea Investigations), No. 15, 128 pp., illus., printed in Danish. 1 Kommission Hos, Copenhagen, Denmark, 1953.

The Ft. Myers, Florida, Fisheries School of the Marine Laboratory of the University of Miami, by Jack Brawner and C. P. Idyll, 4 pp., processed. Marine Laboratory, University of Miami, Coral Gables, Fla. For several years the Marine Laboratory of the University of Miami has sought means of establishing fishery schools in Florida. With the hope that funds would eventually become available, and because of the widespread interest by the industry, it was decided to establish a "pilot" school in Florida in the belief that the experience gained would be of benefit not only to Florida, but other states as well, when a regular program of fishery education became a reality. Ft. Myers was chosen for the first school and it was established on March 1, 1956. This leaflet describes the initial organization of the fishery school, its activities, and objectives. The objectives may be listed as follows: (1) to arouse the interest of boys in the skilled and honorable trade of commercial fishing; (2) to arouse the interest of able students in the professional fisheries field, which, like most technical professions lacks a sufficient number of trained men; and (3) to draw attention to the fisheries industry, and to strengthen it by promoting the production of high-quality fishery products, which will lead to increased sales and prosperity in this important phase of our economy.

"Freezing in Alginate Jelly," by Alf Olsen, article, Norwegian Fishing News, vol. 3, no. 3, 1956, pp. 7-8, printed. Norwegian Fishing News, Ltd., Bergen, Norway. Describes the method of using alginate jelly in the freezing of herring for bait and in the freezing of sardines, shrimp, and small fish. Tests indicate that this method has the following advantages: (1) rancidity is prevented; (2) the fish will not dry up; (3) since the jelly thaws before the fish, the fish can easily be separated without damage; (4) the salts which are added do not migrate, so avoiding a concentration of salts on the surface of the fish; (5) the jelly setting time can be regulated; (6) the freezing time is considerably reduced; (7) the unpleasant smell, so noticeable when frying herring, almost disappears; and (8) when stored in jelly for a period, herring becomes milder in taste.

General Agreement on Tariffs and Trade--Analysis of United States Negotiations--Sixth Protocol (Including Schedules) of Supplementary Concessions, Department of State Publication 6348, Commercial Policy Series 158, 310 pp., processed, $1. Department of State, Washington, D. C., June 1956. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

General Agreement on Tariffs and Trade (Message from The President of the United States Transmitting the Sixth Protocol of Supplementary Concessions to the General Agreement on Tariffs and Trade, Pursuant to Section 4 of the Trade Agreements Extension Act of 1951, as Amended), House Document No. 421, 541 pp., processed. United States Government Printing Office, Washington 25, D. C., 1956.

General Agreement on Tariffs and Trade, Schedule XX, United States of America (Annotated

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to Show Countries With Which Concessions Were Initially Negotiated at Geneva in 1956), Department of State Publication 6362, Commercial Policy Series 159, 127 pp., processed, 60 cents. Department of State, Washington, D.C. (For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D.C.)

How to Produce and Sell Smoked Florida Mullet, by Jack Brawner and Phillip A'Brams, Educational Series No. 8, 16 pp., illus., printed. State Board of Conservation, Tallahassee, Fla., June 1956. The Florida mullet industry is presently in a depressed condition, which is partly the result of a trend towards consumption of packaged fishery products. This report is published primarily for the benefit of small wholesalers and retailers, in an effort to alleviate depressed conditions due to the decline in the demand for fresh fishery products. Detailed instructions are given for building a smokehouse capable of producing up to about 2,000 pounds per week. This smokehouse can be produced cheaply, probably costing less than $100, excluding labor. Instructions are given for smoking mullet, emphasizing the procedures necessary to produce a good product. Potential market outlets for mullet include supermarkets, small grocery stores, retail fish markets, wholesale fish dealers, vegetable truck routes, fish truck routes, delicatessen stores, restaurants, road-side stands, and bars.

"India--Proclamation of the President of India (Sovereign Right over Continental Shelf)" XVI.2/55.1), Food and Agricultural Legislation, vol. IV, no. 3, 1955, 1 p., printed, single copy $1. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.

Informaciones Estadisticas sobre Pesca. Anos 1953-1954 (Statistical Information on Fisheries, 1953-1954), 60 pp., illus., processed in Spanish. Direccion General de Pesca y Caza, Valparaiso, Chile.

Inter-American Specialized Conference on "Conservation of Natural Resources: The Continental Shelf and Marine Waters" (Ciudad Trujillo, March 15-28, 1956), Final Act, Conferences and Organizations Series No. 50, 46 pp., processed, 50¢. Division of Conferences and Organizations, Department of International Law, Pan American Union, Washington, D. C., 1956. The Inter-American Specialized Conference held in Ciudad Trujillo on March 15-28, 1956, was convoked for the purpose of studying as a whole the different aspects of the juridical and economic system governing the submarine shelf, oceanic waters, and their natural resources in the light of present-day scientific knowledge. The resolutions of the Conference are included as well as statements of the delegations from Brazil; Mexico; Costa Rica, Chile, Ecuador, and Peru; Guatemala; El Salvador; Colombia; United States; Cuba; Panama; Uruguay; and Venezuela.

(International Pacific Salmon Fisheries Commission) Annual Report 1955, 41 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, Canada, 1956. A report of the Commission, an international agency appointed under a convention between Canada and the United States for the protection, preservation, and extension of the sockeye salmon fisheries in the Fraser River system. Discussed in this report are the various activities of the Commission during 1955; the regulations, the United States fishery, the Canadian fishery, Indian catch statistics, escapement, the 1956 cycle, rehabilitation of barren areas, watershed protection, and general investigations.

Irish Moss (In the Maritime Provinces), by Constance I. MacFarlane, 20 pp., illus., printed. Nova Scotia Research Foundation, P. O. Box 1027, Halifax, Nova Scotia, 1956. This bulletin is in part a revision of the Fisheries Research Board Atlantic Biological Station Circular No. 10, by A. W. H. Needler (1947) and contains material and excerpts from that paper. It is intended to assist those who may wish to identify Irish moss, to find it, and to dry it for marketing. Numerous problems relating to seaweeds are yet unsolved and many questions remain unanswered in this bulletin. Revision will be necessary from time to time as results become known from further research. The seaweed industry has undergone a series of changes. From being used as a source of potash and iodine in the 18th and 19th centuries, seaweeds have now become a source of extracts though the seaweeds themselves are often used as food or fertilizers. New uses for the extract are constantly being sought. The dairy industry is a large consumer; the baking, confectionery, and pharmaceutical industries also use considerable amounts, as well as the brewing, leather, and paint industries. For most purposes Irish moss extract must compete with other substances, such as various plant gums, synthetic adhesives, and starch. The resulting competitive price makes it necessary for a harvester to gather several hundred pounds per day. An experienced harvester with good equipment can sometimes harvest a thousand pounds at a tide.

"Is Feeding Fish Dangerous?" by A. B. DeHaan, article, The Black Fox Magazine and Modern Mink Breeder, vol. 39, no. 11, March 1956, pp. 13, 26-29, printed, single copy 35 cents. Hoffman Publications, Inc., 425 Fourth Ave., New York 16, N. Y. The author, a well-known mink breeder, discusses some of his problems and experiences in using fish in mink diets.

Ist Baktericides Eis zum Vereisen Frischer Seefische auf den Fishchdampfern Erwiinscht oder Uberhaupt Zulassig? (Is Bactericidal Ice for the Icing of Fresh Sea Fish on Board Fishing Vessels Desirable or at all Admissible?), by T. Seeler, article, Deutsche Lebensmittel Rundschau, 51, 1955, pp. 133-135, printed. Tubinger, S. Strasse 53, Stuttgart, Germany.

Kalamiesten Niksikirja (A Book of Fishermen's Tricks), by E. Halme, 395 pp., illus., print-

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ed in Finnish. Soderstrom Osakeyhtio, Porvoo, Helsinki, Finland, 1955.

"The Lake Sturgeon," by John Van Oosten, article, Texas Game and Fish, vol. XIV, no. 5, May 1956, pp. 12, 25, illus., printed, single copy 20 cents. State Game and Fish Commission, Walton Bldg., Austin, Tex.

"The Lake Trout Endangered in the Great Lakes," by James W. Moffett, article, Our Endangered Wildlife, pp. 23-24, printed. National Wildlife Federation, 232 Carroll St. NW., Washington 12, D. C.

Laws Concerning the Nationality of Ships, Doc. ST/LEG/SER.B/5, 200 pp., printed, $1.50. United Nations Department of Public Information, Press and Publications Division, United Nations, N. Y.

This book was prepared by the Codification Division of the UN Office of Legal Affairs, primarily for the use of the International Law Commission in its continuing comprehensive study of the regime of the high seas.

The Commission has been engaged upon the task of codifying the law of the high seas and of territorial waters ever since its first session in 1949.

No attempt is made in the new volume to present conclusions, or to classify the information contained, most of which was furnished by governments at the request of Secretary-General Dag Hammarskjold. In cases where governmental information was not available, other sources were consulted. Most of the texts are in English, but a few, which were submitted in French, are presented in that language.

In a brief introduction, the Codification Division notes that there is "no uniformity" in the conditions on which states allow merchant ships to fly their flags. It goes on, however, to quote an earlier report on the regime of the high seas by J. P. A. Francois, noted Netherlands legal authority and a member of the International Law Commission, who said: "The acknowledged freedom of a State to lay down the conditions on which it shall grant its nationality to ships is, of necessity, based on the concept that the national element with regard to a ship and the manner in which it is used have a wide variety of application, and that a certain minimum should be guaranteed in the general interest of all who use the high seas."

A Measured Delay in the Migration of Adult Chinook Salmon at Bonneville Dam on the Columbia River, by Robert W. Schoning and Donald R. Johnson, Contribution No. 23, 17 pp., illus., printed. Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Oreg., May 1956.

Methods of Exterminating Wild Fish in Ponds, by S. Sarig, Bamidgeh, Bulletin of Fish Culture in Israel, vol. 6, no. 1, printed in English and Hebrew. Department of Fisheries, Ministry of Agriculture, Agricultural Publications Section, P. O. Beit-Shean, Israel, 1954.

Modern Marine Engineering, by D. W. Rusdorff, 154 pp., illus., printed, $4.75. Philosophical Library, 15 East 40th St., New York 16, N. Y. A concise review of the various types of propulsion plants now in use in vessels for different services.

Modern Naval Architecture, by W. Muckle, 154 pp., illus., printed, $4.75. Philosophical Library, 15 East 40th St., New York 16, N.Y. Gives an account of the various problems the naval architect must solve.

Nord- og Sor-Norsk Naeringsliv, 1955-1956--Fiskeindustri--Fiskerier--Produksjon og Handel (North- and South-Norwegian Industries, 1955-1956--Fish Processing Industry--Fisheries--Production and Commerce), 354 pp., illus., printed in Norwegian and English. Halvorsen & Larsen A/s, Trondhjemsvn. 72, Oslo, Norway. Includes the following articles with English translations: "Territorial Limits and Fishery Protection," by C. J. Hambro (in English only); "The Organization of the Fisheries Administration in Norway," by Johs. Sellaeg; "International Agreements for the Protection of Fish Stocks," by Johs. Sellaeg; "The Scandinavian Fishery Conferences," by Johs. Sellaeg; "The Norwegian Fisheries," by Johs. Sellaeg (in English only); "Norwegian Fish Exports--General Survey," by Per Rogstad; "Sales Organizations in the Norwegian Fisheries Industry," by Per Rogstad; "Exports of Herring and Herring Products," by Magne Oppedal; "The Export of Fresh and Frozen Fish (Other than Herring), Stockfish, Klipfish and By-products," by Carl Bjorge; "The Norwegian Herring Oil and Herring Meal Industry," by M. Midsem; "Refrigeration Plants in the Norwegian Fisheries Industry," by M. Midsem; "The Relief Service for the Sealers in the Western Ice," by Birger Rasmussen; and "The Result of the Sealing for 1954." Other articles on fisheries, in Norwegian only, are also included.

Norges Matnyttige Fisk (Norwegian Edible Fish), by H. Tambs-Lyche, Fiskeridirectoratets Skrifter, Ser. Fishkeri, vol. 3, no. 4, 132 pp., printed in Norwegian. Director of Fisheries, Bergen, Norway, 1955. Gives a very good summary of present knowledge of commercial fishes in northern waters. For nearly every important fish the following descriptions and data are given: (1) Norwegian catches from various waters and the comparative values from several other countries; (2) geographical distribution of the species and various stocks; (3) summary on the studies of the biology and ecology of the species; and (4) life history. This book is very useful for fisheries education and as a handbook for the scientists in related fields (e.g., the hydrographer).

"Norway--Regulations Relating to the Protection of Brisling and to the Canning of Brisling and Small Herring," XVI.5/55.1, Food and Agricultural Legislation, vol. IV, no. 3, 1955, 5 pp., printed, single copy $1. Columbia Uni-

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versity Press, International Documents Service, 2960 Broadway, New York 27, N. Y.

"Norway--Regulations Relating to the Handling, Processing and Transport of Fish to be Converted into Salted Fish, Klipfisk and Stockfish," XVII.2/55.1, Food and Agricultural Legislation, vol. IV, no. 3, 1955, 11 pp., printed, single copy $1. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.

"Observations on the Shoaling Behaviour of Cod (Gadus callarias) in Deep Water Relative to Daylight," by G. H. Ellis, article, Journal of the Marine Biological Association of the United Kingdom, vol. 35, no. 2, 1956, pp. 415-417, illus., printed. Cambridge University Press, 32 East 57th St., New York 22, N. Y. During a commercial fishing voyage to the Barents Sea continuous observations were made on the shoaling behavior of cod in deep water over a period of 19 hours. The cod were studied by the use of a Kelvin and Hughes MS. 24J recording echo-sounder. Compact cod shoals recorded in 100-fm. during daylight dispersed at sunset and re-formed at sunrise. The maximum possible vertical movement of the fish during observation was 30 fm. The catches did not vary significantly with the formation of the cod.

The Occurrence and Taxonomic Relationships of the Blue Marlin (MAKAIRA AMPLA Poey) in the Pacific Ocean, by Luis Rene Rivas, Contribution No. 153, 15 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 6, no. 1, March 1956, pp. 59-73.) Marine Laboratory, University of Miami, Coral Gables, Fla.

Opbevaring af Levende Hummer (Storage of Live Lobster), by F. Bramsnaes and Jan Boetius, 16 pp., illus., printed in Danish with summary in English. (Reprinted from Meddelelse fra Fiskeriministeriets Forsøgslaboratorium, Nov. 1953) Fiskeriministeriets, Borgergade 16, Copenhagen, Denmark.

(Oregon) Fisheries Statistics of Oregon, 1950-1953, Contribution No. 22, 33 pp., printed. Fish Commission of Oregon, Portland, Oregon, February 1956. This statistical bulletin provides a ready source of information concerning the productivity of the marine and river commercial fisheries of the State of Oregon for 1950-1953. These fisheries data are given in pounds by species, rivers, and months.

A Pattern of Coastal Circulation Inferred from Synoptic Salinity Data, by Ilmo Hela, Contribution No. 154, 10 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 6, no. 1, March 1956, pp. 74-83.) Marine Laboratory, University of Miami, Coral Gables, Fla.

La Pesca en Espana, I. Cataluna (Fisheries of Spain. I. Catalonia), by C. Bas, E. Morales, and M. Rubio, 468 pp., illus., printed in Spanish. Instituto de Investigacione Pesqueras, Barcelona, Spain, 1955. The first of a series, this publication covers: physical conditions of fisheries; fishing boats and gear; marine productivity; the fishery; ports and fishing beaches; economics; and present-day fisheries.

Pesca y Caza (Fishing and Hunting), no. 7, 100 pp., illus., processed in Spanish. Ministerio de Agricultura, Direccion de Pesqueria y Caza, Lima, Peru, 1956. Includes, among others, articles on Peru's fisheries and data for 1953, some new fish species, shellfish, and a description of some of Peru's more common species.

Plants and Animals of the Sea-Shore, by W. J. Prud'Homme van Reine, translated from the Dutch and adapted for the coasts of Britain in collaboration with Mona C. Harrison, 144 pp., illus., printed. John Murray, Albemarle Street, W., London, England, 1955. A handy guide containing drawings and descriptions of over 450 species of fish, shellfish, seaweeds, birds, etc.

Practical Marine Engineering, by Reno C. King, Jr., 2nd edition, 541 pp., illus., printed, $7.35. Prentice Hall, 70 5th Ave., New York 11, N. Y. Outgrowth of lectures given to applicants for Merchant Marine Engineering Officer licenses.

"The Pygmy Whitefish, Coregonus coulteri, in Lake Superior," by Paul H. Eschmeyer and Reeve M. Bailey, article, Transactions of the American Fisheries Society, 1954, vol. 84, pp. 164-199, printed. American Fisheries Society, Colorado A and M College, Fort Collins, Colo.

Recent Developments in the Freezing of Fish at Sea. II.--The Quality of Sea-Frozen Cod, by A. Banks, DSIR Food Investigation Memoir No. 965, 3 pp., printed. (Reprinted from Chemistry and Industry, 1955, pp. 1360-1362.) Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland. Discusses investigations on the quality of fish treated in different ways before freezing and cold storage. These investigations have shown that the fish should be gutted and well iced very soon after catching; that they should not be held for longer than three days in ice before freezing, and that the frozen products should be cold-stored at -28° to -30° C. Treated in this way, the products on thawing should prove highly acceptable, and a properly arranged scheme of freezing at sea based on these principles should do much to improve the over-all quality of fish caught on distant fishing grounds.

Relation of Chemical Structure to Irritant Responses in Marine Fish, by Robert W. Hiatt, John J. Naughton, and Donald C. Matthews, Contribution No. 36, 6 pp., printed. (Reprinted from Nature, vol. 172, November 14, 1953, p. 904.) Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii.

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"Report on the Distribution and Abundance of Pacific Herring (Clupea pallasi) along the Coast of Central and Southern California," by Daniel J. Miller and John Schmidtke, article, California Fish and Game, vol. 42, no. 3, July 1956, pp. 163-187, illus., printed. Department of Fish and Game, 926 J St., Sacramento 14, Calif.

Report on Research from the ERNEST HOLT into the Fishery near Bear Island, 1949 and 1950, by M. Graham, G. C. Trout, R. J. H. Beverton, J. Corlett, A. J. Lee, and R. W. Blacker, Fishery Investigations Series II, vol. XVIII, no. 3, 87 pp., illus., printed, 12s. 6d. (US$1.75). H. M. Stationery Office, York House, Kingsway, London, W. C. 2, England, 1954.

"The Reproduction of Lake Trout in Southern Lake Superior," by Paul H. Eschmeyer, article, Transactions of the American Fisheries Society, 1954, vol. 84, pp. 47-74, printed. American Fisheries Society, Colorado A and M College, Fort Collins, Colo.

Research Briefs, vol. 6, no. 2, December 1955, 41 pp., illus., printed. Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Oreg. Includes the following articles: (1) "Size Composition, Growth, and Seasonal Abundance of Juvenile English Sole (Parophrys vetulus) in Yaquina Bay," by Sigurd J. Westrheim; (2) "Fifth Progress Report on Salmon Diet Experiments," by Wallace F. Hublou, Thomas B. McKee, Ernest R. Jeffries, Russell O. Sinnhuber, and Duncan K. Law; (3) "A Survey of the Bull Kelp Resources of the Oregon Coast in 1954," by Kenneth D. Waldron; (4) Escapement of Spring Chinook Salmon and Steelhead Over Willamette Falls in 1954," by Earl F. Pulford; (5) "River Recoveries of Marked Silver Salmon of the 1949 Brood Released from the Nehalem River Hatchery," by Kenneth A. Henry; and (6) "Kidney Disease in Adult Chinook Salmon and Its Transmission by Feeding to Young Chinook Salmon," by James W. Wood and Joe Wallis.

The Scientific Name of the Nehu, and Engraulid Baitfish of the Hawaiian Islands, by William A. Gosline, Contribution No. 5, 1 p., printed. (Reprinted from Pacific Science, vol. V, no. 3, July 1951, p. 272.) Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii.

Sea Moss (CHONDRUS CRISPUS), Survey Pemaquid Point to Owls Head, by Walter S. Foster, General Bulletin No. 5, 8 pp., illus., printed. Department of Sea and Shore Fisheries, Vickery-Hill Bldg., Augusta, Me., December 1955. In surveying the sea moss, Chondrus crispus, an attempt has been made to determine the amount of moss an average moss raker could gather from the ledges and islands from Pemaquid Point to Owls Head. Includes maps of the regions surveyed showing density of moss and a code used to express in general terms the prevailing sea moss raking and growing conditions of the particular areas indicated on the maps.

The Selective Action of Gill Nets on Fraser River Sockeye Salmon, by Alvin E. Peterson, Bulletin 5, 101 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1954.

Ship and Boat Builder Annual Review, 1955, 382 pp., illus., printed, 30s. (US$4.20). John Trundell Ltd., Temple Chambers, Temple Ave., London, E. C. 4, England.

"Snapping Turtle (Chelydra serpentina)," by George J. Knudsen, article, Wisconsin Conservation Bulletin, vol. 21, no. 5, May 1956, pp. 36-37, illus., printed. Wisconsin Conservation Dept., Madison 1, Wis. A brief description of Wisconsin's snapping turtle and its habits.

Some Aspects of the Schooling Behaviour of Fish, by Miles H. A. Keenleyside, 66 pp., illus., printed. (Reprinted from Behaviour, vol. VIII, 2-3, pp. 183-248.) E. J. Brill, Leiden, Netherlands, 1955.

The South African Fishing Industry Handbook and Buyers' Guide, 1956, 245 pp., illus., printed, £2 2s. (US$5.90). South African Shipping News and Fishing Industry Review, Box 2598, Cape Town, South Africa, 1956. This is the third edition of a handbook designed to acquaint readers with the various aspects of the South African fishing industry. The book is divided into several sections. "Marine Resources of South Africa" discusses South Africa's place in the world's fish trade, the processing factories, the trawling industry, the rock lobster industry, fishing in South-West Africa, and South African fish species. The list of species in this section gives the English, Afrikaans, and scientific name for each species caught in South Africa. In the section "Organizations Serving the Industry," the following are described: The Division of Fisheries, the Fishing Industry Research Institute, the Fisheries Development Corporation, Weskus-Vissersvereniging (West Coast Fishermen's Association), the South African Bureau of Standards, the Food and Agriculture Organization, as well as a description of the control of fisheries in South-West Africa, fishing harbors in South Africa, and inshore fishing industry organizations. Brief biographical notes on the leading personalities professionally connected with the industry are to be found in the section "Who's Who in the Fishing Industry." "Guide to Companies in the Fishing Industry" is a section which lists the names, functions, addresses, factories, capital, directors, and affiliations of companies operating in South and South-West Africa. A classified list of fish products with brand and producers' names is contained in the section "Products of the Fishing Industry." "Suppliers to the Fishing Industry--Buyers' Guide" is a classified list of products offered to the fishing industry. Details on South African motor fishing boats, motor trawlers, and steam trawlers, and South-West African boats, and other miscellaneous craft are given in the

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section "Fishing Craft Operating in South and South-West Africa." The last section--"Marine Engines"--is a detailed list of engines offered for installation in South and South-West African fishing boats.

"Status of Sea Lamprey Control," by James W. Moffett, article, Wisconsin Conservation Bulletin, vol. 21, no. 4, April 1956, pp. 14-17, illus., printed. Wisconsin Conservation Dept., State Office Bldg., Madison 1, Wis. This article reports progress in the application of sea-lamprey control measures. According to the author, "The lamprey is likely to cause further damage before it is controlled. Electromechanical weirs can solve the problem slowly. Selective poisons are promising but largely unproved and unavailable in quantity."

Studies on the Question of Salmon "Economy" in the Far East, 207 pp., illus., printed in Russian. Akademija Nauk SSSR, Ihtiologitseskaja Komissija, Moscow, Russia, 1954. Discusses the biological, economical and fisheries technological problems of Pacific salmons off the Russian Pacific coast.

Theoretical Yields at Various Rates of Natural and Fishing Mortality in Stabilized Fisheries, by Albert L. Tester, Contribution No. 30, 8 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 82, 1952, pp. 115-122.) Marine Laboratory, University of Hawaii, Honolulu, Hawaii, 1953. This paper presents a series of curves depicting the yields for fisheries stabilized at various rates of natural and fishing mortality, for each of three types of S-shaped growth curve: Type A, point of inflection early in life; Type B, point of inflection about mid-life; and Type C, point of inflection late in life.

A Triple Frequency Echo Sounder, by D. H. Cushing and I. D. Richardson, Ministry of Agriculture, Fisheries and Food Fishery Investigations, Series II, vol. XX, no. 1, 20 pp., illus., printed, 3s. (40 U.S. cents). Her Majesty's Stationery Office, London, England, 1955. In experiments with dead fish hung from below an echo sounder significant differences between signals returned from cod and herring were found, using any one frequency; it was further found that a lower frequency would be best for cod and a higher frequency best for herring. This required testing on fish shoals in the sea, partly because in the experimental work some part of the echo received might have been due to the frame and partly because the arrangement of the dead fish in a shoal was an artificial one. Another subject for investigation was that of the variability in signal amplitude, which might well be proportional to the number of fish per unit volume. In order that these two points might be investigated, a triple frequency echo sounder was designed and used in the investigations described in this paper.

"Two Obscure Oyster Enemies in New England Waters," by V. L. Loosanoff, article, Science, vol. 123, no. 3208, June 22, 1956, pp. 1119-1120, printed, single copy 25 cents. American Association for the Advancement of Science, Business Press, Lancaster, Pa. Describes two forms of oyster enemies recently observed in New England waters which may be responsible for several "mysterious" mortalities of oysters, especially the young. One of these enemies is a flatworm, the polyclad (Stylochus ellipticus), and the other is a small gastropod (Menestho bisuturalis).

Uber die Verwendung von Bactericiden Zusatzen beim Waschen von Frischfisch (The Use of Bactericidal Additives in the Washing of Fresh Fish), by W. Partmann, article, Kaltetechnik, 7, 1955, pp. 270-275, printed. Kaltetechnik, Lamnnstrasse 2-4, Karlsruhe, Germany.

(Uganda) Annual Report of the Game and Fisheries Department (For the Period 1st January, 1954, to 30th June, 1955), 143 pp., illus., printed, 6s. (84 U.S. cents). Government Printer, P. O. Box 33, Entebbe, Uganda, 1956. Includes a section on the fisheries of Uganda by regions: Lake Albert; Lakes George/Edward; and Lake Kyoga. Development in the fisheries has been rapid in some directions and steady in others. Fish production has been stepped up, new fisheries opened, dams and lakes stocked, improved equipment and methods introduced, and marketing facilitated. New craft have been demonstrated and training in boat building introduced, while a start has been made in stocking trout in the rivers of Mt. Elgon, Ruwenzori, and north Acholi. Fish farming is developing with rapidly increasing momentum and the Department's experimental and demonstration fish farm at Kajansi, which only two years ago was a block of dense tropical rain forest, already covers 20 acres of specially-constructed fry and production ponds, feeder furrows, and auxiliary buildings. Statistics are given for the 1954 catch of fishery products by months and species for Lake George and by species for Lake Edward and Kazinga Channel, as well as quantities and values of salted and smoked fish exports in 1954. Other sections of the report deal with game.

"An Undescribed Type of Migration in King Salmon, Oncorhynchus tshawytscha (Walbaum)," by Howard McCully, article, California Fish and Game, vol. 42, no. 3, July 1956, pp. 189-198, illus., printed. Department of Fish and Game, 926 J St., Sacramento 14, Calif.

The Use of Chemical Additives in Food Processing (A Report by the Food Protection Committee of the Food and Nutrition Board), Publication 398, 97 pp., printed, $2. National Academy of Sciences--National Research Council, Washington 25, D.C., February 1956. The Food Protection Committee of the National Research Council has undertaken a study of the use of chemicals in foods for the purpose of evaluating the technological benefits arising from such use and of appraising the significance of associated public health problems. This report deals only with a survey of the extent of use and technological benefits of use of inten-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

tional chemical additives, including transient chemicals and naturally-occurring substances used as additives.

Various Species of Cod, by A. N. Svetovidov, Fauna of the U.S.S.R. New Series No. 34, vol. IX, no. 4, printed in Russian. Zoological Institute of Academy of Science of U.S.S.R., Moscow, Russia, 1948.

(Virginia) Laws of Virginia Relating to Fisheries of Tidal Waters, 1956 Cumulative Supplement, 20 pp., printed. (Reprinted from the 1956 Cumulative Supplement to the Code of Virginia of 1950.) Commission of Fisheries of Virginia, Newport News, Va., 1956.

"Walrus Hunt," by Edward Weyer, Jr., article, Natural History, vol. LXV, no. 1, January 1956, pp. 28-32, illus., printed, single copy 50 cents. American Museum of Natural History, New York 24, N.Y. Describes the annual walrus hunt of the Iglulik Eskimos which is one of the most hazardous pursuits in the arctic. The walrus hunt illustrates how vital and indispensable a weapon the harpoon is to any people who lives by sea hunting. This implement has permitted the survival of tribes in regions otherwise uninhabitable. This article describes the hunting techniques, the many hazards encountered, and the task of landing a walrus.

Washington Department of Fisheries, 64th Annual Report, 63 pp., illus., printed. Washington State Department of Fisheries, Seattle, Wash., May 1956. This report discusses the activities and objectives of the Department of Fisheries for the year 1954. Many details of the technical investigations have been omitted, since these results are now published in two new series of research papers and bulletins. Much statistical data has been published previously and also is mentioned only briefly; on the other hand, greater emphasis has been placed on pictorial reporting. As another departure, an independent report has been selected for the introductory chapter--the report and recommendation of the Washington Legislative Interim Fisheries Committee to the 1955 Legislature. It reflects close contact with the problems and developments, fishery-wise, of the years since 1951 and with program needs for the years ahead. In addition, the report contains information on the big sockeye run of 1954, hatchery research and operations, stream and marine research, fishways and stream improvements, shellfish research, power dam and fish research, pollution research, fisheries patrol, and 1954 fisheries news log.

Work of All-Union Conference of Fisheries, Fisheries Management (Problems of Dynamical Enumeration of Fish, Fishing Prognosses, and Reproduction of Fish Stocks), 602 pp., illus., printed in Russian. Akademija Nauk SSSR., Ihtiologitseskaja Komissija, Moscow, Russia, 1953. Part II--Reports and Discussions on the Problems of Enumeration of Fish and Fishing Prognoses--contains, among others, the following reports: "Fluctuations in Numbers of Fish and Methods of Prediction of Fishing Results," by T. F. Dementjeva; "On the Causes of Fluctuations in the Amount of Pacific Salmon and the Problems in the Rational Use of Stocks," by R. S. Semko; and "Unknown Factors Relating to Enumeration of Herring," by A. N. Svetovidov. Part IV--Reports and Discussions on Problems of Biological Productivity of Waters--contains, among others, the following reports: "On Problems of Biological Productivity of the Sea and its Importance for Fisheries Economy," by V. A. Vodjanitskii; "Regarding Protection of Fish Food Resources in Sea Water," by L. A. Zenkevich; and "On the Ways of Increasing Fish Food Production in the White Sea," by V. V. Kuznetsov.

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FISH PARADE (OCT. 29-NOV. 3)

NATIONAL PROGRAM: Advertisements reproduced below were scheduled to appear in Chain Store Age, Nargus Bulletin, Frozen Food Age, Progressive Grocer, American Restaurant, Restaurant Management, and Fountain & Fast Food magazines beginning in July and running through September. Also, a number of other publications are carrying this same story, through their editorial pages, to their readers throughout the country.

The National Retail Grocers Association and the National Restaurant Association are cooperating and were to send out material to all of their members. Many chain store companies have indicated that they want to tie-in with the program.

The Reynolds Metals Company will, through their national television network program, "Circus Boy," kick off the program by featuring the 1956 "FISH PARADE" on Sunday night, October 21.

PUBLICITY: An all-industry consumer and trade publicity campaign will run in newspapers, magazines, radio, television, and grocery and restaurant publications. Chain and independent retail organizations are advising their members how they can cash in on this promotion. Allied industries such as the Rice Industry will feature the "FISH PARADE" in their own publicity and advertising.

FISH AND WILDLIFE SERVICE COOPERATION: The Fish and Wildlife Service will notify all food trade associations of the program, and will issue press releases by the Secretary of the Interior announcing support of the program. Radio, TV, and press food editors will be contacted as well as state and local restaurant associations, public utility units, and similar marketing groups. The Department of Agriculture will list the program as a Merchandising Opportunity in the tie-in material that goes to the Plentiful Foods List.